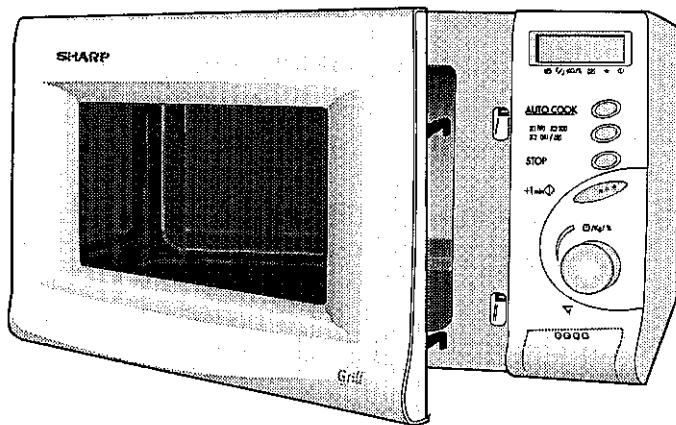


SHARP® SERVICE MANUAL

S8772R630AEHW



GRILL AND MICROWAVE OVEN

MODELS **R-630A(W)/(IN)**
R-630A(B)

In interests of user-safety the oven should be restored to its original condition and only parts identical to those specified should be used.

TABLE OF CONTENTS

	Page
CAUTION, MICROWAVE RADIATION / WARNING / GENERAL INFORMATION	1
SERVICING	2
CAUTION WARNING / PRODUCT DESCRIPTION	5
APPEARANCE VIEW / CONTROL PANEL	6
OPERATION SEQUENCE	7
FUNCTION OF IMPORTANT COMPONENTS	8
TEST PROCEDURE	10
TOUCH CONTROL PANEL ASSEMBLY	19
COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE	23
MICROWAVE MEASUREMENT	28
TEST DATA AT A GLANCE	29
WIRING DIAGRAM	30
PICTORIAL DIAGRAM	32
CONTROL PANEL CIRCUIT	33
PRINTED WIRING BOARD	34
PARTS LIST	35

SHARP CORPORATION

CAUTION MICROWAVE RADIATION

Personnel should not be exposed to the microwave energy which may radiate from the magnetron or other microwave generating devices if it is improperly used or connected. All input and output microwave connections, waveguides, flanges and gaskets must be secured.

Never operate the device without a microwave energy absorbing load attached. Never look into an open waveguide or antenna while the device is energized.

VARNING MICKROVAGGSSTRALING

Personal får inte utsättas för mikrovågsenergi som kan ustrala från magnetronen eller andre mikrovågsalstrande anordningar om dessa är felanslutna eller används på fel sätt. Alla in-och utgångsanslutningar för mikrovågor, vagledare, flänsar och packningar måste vara fast anslutna.

Mikrovågsgeneratorn får inte arbeta utan att absorberande belastning är ansluten. Titta aldrig in i en öppen vågledare eller antenn när mikrovågsgeneratorn är påkopplad eller laddad.

VAROITUS MIKROAALTOSÄTELYÄ

Käyttäjä ei saa joutua alittiaksi mikroaaltoenergialle, jota voi säteillä magnetronista tai muusta mikroaaltoja kehittävästä laitteesta, jos sitä käytetään tai jos se kytketään väärin. Kaikkien mikroaaltoilittäntöjen sekä syöttö-että ulostulopuolella, aaltoputkien laippojen ja tiivisteiden tulee olla varmistettuja.

Mikroaaltounnia ei koskaan saa käyttää ilman kuormaa jossa mikroaaltoenergiaa kuluu. Avoimeen aaltoputkeen tai antenniin ei koskaan saa katsoa virran ollessa kytkettynä.

ADVARSEL MIKROBØLGESTRÅLING

Personell må ikke utsettes for mikrobølge-energi som kan utståles fra magnetronen eller andre mikrobølge-generende deler dersom apparatet feilbetjenes eller blir feiltikoplet. Alle inn-og ut-tilkoplinger i forbindelse med mikrobølge-strålingen, bølgeledere, flenser og tetningsringer/pakninger må festes ordentlig.

Aldri bruk apparatet med mindre en mikrobølge-absorberende last er plassert i ovnsrommet.

Aldri se direkte inn i en åpen bølgeleder eller antennen imens apparatet er strømførende.

ADVARSEL MIKROBØLGEBESTRÄLING

Man bør ikke udsætte sig for mikrobølgebestråling fra magnetronen eller andre mikrobølgefrembringende anordninger, hvilket kan ske hvis apparatet er forkert tilsluttet eller bruges forkert. Alle mikrobølgeindgange og-udgange, bølgeledere, flanger og tætningsstrimler må være forsvarligt udført.

Anvend aldrig ovnen uden en mikrobølgesabsorberende anordning. Se aldrig ind i en åben bølgeleder eller antennen, mens ovnen er i brug.

SERVICE MANUAL

SHARP

GRILL AND MICROWAVE OVEN

R-630A (W) / R-630A (B)
R-630A (IN)

GENERAL IMPORTANT INFORMATION

This Manual has been prepared to provide Sharp Corp. Service engineers with Operation and Service Information.

It is recommended that service engineers carefully study the entire text of this manual, so they will be qualified to render satisfactory customer service.

CAUTION MICROWAVE RADIATION

**DO NOT BECOME EXPOSED TO RADIATION FROM
THE MICROWAVE GENERATOR OR OTHER PARTS
CONDUCTING MICROWAVE ENERGY.**

WARNING

Note: The parts marked "*" are used in voltage more than 250V. (Parts List)

Anm: Delar märket med "*" har en spänning överstigande 250V.

Huom: Huolto-ohjeeseen merkity "tähdellä" osat joissa jännite on yli 250 V.

Bemerk: Deler som er merket "asterisk" er utsatt for spenninger over 250V til jord.

Bemærk: "Deler mærket med stjerne benyttes med højere spænding end 250 volt.

WARNING

Never operate the oven until the following points are ensured.

(A) The door is tightly closed.

(B) The door latches and hinges are not defective.

(C) The door is not deformed or warped.

(D) There is not any other visible damage with the oven.

Servicing and repair work must be carried out only by trained service engineers.

Removal of the outer wrap gives access to potential above 250 V.

All the parts marked "Δ" on the parts list may cause undue microwave exposure, by themselves, or when they are damaged, loosened or removed.

SHARP CORPORATION

OSAKA, JAPAN

SERVICING

PRODUCT SPECIFICATION /
GENERAL INFORMATION

APPEARANCE VIEW /
CONTROL PANEL

OPERATING SEQUENCE

FUNCTION OF IMPORTANT
COMPONENTS

TEST PROCEDURE

COMPONENT
REPLACEMENT AND
ADJUSTMENT PROCEDURE

MICROWAVE MEASUREMENT

TEST DATA AT A GLANCE

WIRING DIAGRAM

PARTS LIST / EXPLODED VIEWS

PACKING & ACCESSORIES

SERVICING

WARNING TO SERVICE PERSONNEL

(GB) Microwave ovens contain circuitry capable of producing very high voltage and current, contact with following parts will result in electrocution.
High voltage capacitor, Power transformer, Magnetron, High voltage rectifier assembly, High voltage harness.

REMEMBER TO CHECK 3D

- 1) Disconnect the supply.
- 2) Door opened, and wedged open.
- 3) Discharge high voltage capacitor.

WARNING AGAINST THE CHARGE OF THE HIGH-VOLTAGE CAPACITOR

The high-voltage capacitor remains charged about 60 seconds after the oven has been switched off. Wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is, of the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

Sharp recommend that wherever possible fault-finding is carried out with the supply disconnected. It may in, some cases, be necessary to connect the supply after the outer case has been removed, in this event carry out 3D checks and then disconnect the leads to the primary of the power transformer. Ensure that these leads remain isolated from other components and the oven chassis. (Use insulation tape if necessary.) When the testing is completed carry out 3D checks and reconnect the leads to the primary of the power transformer.

REMEMBER TO CHECK 4R

- 1) Reconnect all leads removed from components during testing.
- 2) Replace the outer case (cabinet).
- 3) Reconnect the supply.
- 4) Run the oven. Check all functions.

Microwave ovens should not be run empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the oven turntable, close the door and set the power to HIGH and set the microwave timer for two (2) minutes. When the two minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out 3D checks and re-examine the connections to the component being tested.

When all service work is completed, and the oven is fully assembled, the microwave power output should be checked and a microwave leakage test carried out.

(NL) Magnetronovens bevatten circuits die een zeer hoge spanning en stroom kunnen voortbrengen. Contact met de volgende onderdelen kan elektrocutie tot gevolg hebben.
Hoogspanningscondensator, hoogspanningstransformator, magnetron, hoogspanningsgelijkrichter, hoogspanningskabelboom.

VERGEET DE VOLGENDE 3 STAPPEN NIET

- 1) Haal de stekker uit het stopcontact.
- 2) Open de deur en zorg ervoor dat hij niet dicht kan vallen.
- 3) Ontlaad de hoogspanningscondensator.

PAS OP VOOR DE ELECTRISCHE LADING VAN DE HOOGSPANNINGSCONDENSATOR

De hoogspanningscondensator blijft nog ongeveer 60 seconden lang opgeladen, nadat de oven is uitgeschakeld. Wacht 60 seconden voordat u de verbinding van de hoogspanningscondensator (m.a.w. de verbindingssdraad van de hoogspanningsgelijkrichter) met een geïsoleerde schroovedraaier kortsluit tegen het chassis.

Sharp beveelt ten sterkste aan dat, voor zover mogelijk, defecten worden opgespoord wanneer de stekker uit het stopcontact is gehaald. Soms is het nodig om de stroomtoevoer weer tot stand te brengen nadat de buitenmantel verwijderd is. Herhaal dan de bovenstaande 3 stappen en haal de elektrische draden uit de primaire zijde van de vermogenstransformator. Zorg ervoor dat deze draden geïsoleerd blijven van andere elementen en van het chassis van de oven. (Gebruik zo nodig isolatieband.) Wanneer de test is uitgevoerd, herhaalt u de bovenstaande 3 stappen en verbindt u de elektrische draden weer aan de primaire zijde van de vermogenstransformator.

VERGEET DE VOLGENDE 4 STAPPEN NIET

- 1) Sluit de draden weer aan die zijn losgehaald voor de test.
- 2) Plaats de buitenmantel weer om het toestel heen (kabinet).
- 3) Stop de stekker weer in het stopcontact.
- 4) Zet de oven aan. Controleer alle functies.

Magnetronovens mogen niet leeg aangezet worden. Om te controleren of er microgolf-energie binnen de oven wordt geproduceerd, plaatst u een mok met koud water op de draaitafel van de oven, sluit de deur, zet de oven op HIGH en stelt de klok van de magnetron in op twee (2) minuten. Wanneer de twee minuten voorbij zijn (klok staat op nul), controleert u voorzichtig of het water heet is. Indien het water nog steeds koud is, herhaalt u de allereerste drie stappen en controleert nogmaals de aansluitingen naar de geteste onderdelen.

Wanneer alle reparaties zijn uitgevoerd en de oven weer in elkaar is gezet, moet de het magnetronvermogen worden gecontroleerd en moet worden gecontroleerd of er geen microgolflekkage is.

SERVICING

E Los hornos de microondas contienen circuitos eléctricos capaces de producir voltajes de alta tensión y descargas eléctricas. Para evitar el riesgo de electrocución, absténgase de tocar los siguientes componentes: condensador de alta tensión, transformador de alta tensión, magnetrón, dispositivo del rectificador de alta tensión y arnés de alta tensión.

RECUERDE LA COMPROBACION 3D

- 1) Desconecte la alimentación.
- 2) Deje la puerta abierta y calzada.
- 3) Descargue el condensador de alto voltaje.

ADVERTENCIA SOBRE LA CARGA DEL CONDENSADOR DE ALTO VOLTAJE

El condensador de alto voltaje permanece cargado unos 60 segundos después de haber apagado el horno. Espere 60 segundos y luego ponga en cortocircuito la conexión del condensador de alto voltaje (esto es, del conductor de conexión del rectificador de alto voltaje) al chasis con un destornillador de mango aislado.

Se recomienda encarecidamente que siempre que sea posible la localización de fallos se realice con la alimentación desconectada. Puede ser que en algunos casos sea necesario conectar la alimentación después de haber retirado la carcasa exterior. En este caso, realice las comprobaciones 3D y luego desconecte los conductores del primario del transformador de alimentación. Asegúrese de que estos conductores permanezcan aislados de otros componentes y del chasis del horno. (Use cinta aislante si es necesario). Cuando termine la prueba efectúe las comprobaciones 3D y reconecte los conductores al primario del transformador de alimentación.

RECUERDE LA COMPROBACION 4C

- 1) Conecte todos los componentes desconectados de los componentes durante la prueba.
- 2) Coloque la carcasa exterior (cabina).
- 3) Conecte la alimentación.
- 4) Compruebe todas sus funciones después de poner en marcha el horno.

Los hornos de microondas no deben funcionar vacíos. Para comprobar la presencia de energía de microondas dentro de una cavidad, coloque una taza de agua fría en el plato giratorio del horno, cierre la puerta y ponga la potencia en HIGH (alta) y coloque el temporizador en dos (2) minutos. Cuando transcurran los dos minutos (temporizador a cero) compruebe cuidadosamente que el agua se ha calentado. Si el agua permaneciese fría, efectúe las comprobaciones 3D y vuelva a examinar las conexiones de los componentes que han sido probados.

Cuando haya terminado la intervención en el equipo y el horno haya sido ensamblado de nuevo completamente, deberá comprobar la potencia de salida de microondas y realizar una prueba de fugas de microondas.

SV Mikrovågsugnar innehåller kretsar som producerar mycket höga spänningar och strömmar. Kontakt med följande komponenter kan leda till dödsfall:

Högspänningskondensator, transformator, magnetron, högspänningsslikriktare, högspänningss kablage.

KOM IHÅG ATT KONTROLLERA 3 STEG

- 1) Koppla från strömkällan.
- 2) Öppna dörren på glänt.
- 3) Ladda ur högspänningkondensatorn.

VARNING FÖR LADDNINGEN I HÖGSPÄNNINGSKONDENSATORN

Högspänningkondensatorn är laddad i 60 sekunder efter det att ugnen stängts av. Vänta 60 sekunder och korislut sedan kondensatorns anslutning (dvs anslutningen till högspänningsslikriktaren) till chassiet med hjälp av en isolerad skruvmejsel.

Sharp rekommenderar att felsökning sker med strömmen fräckkopplad. Ibland kan det vara nödvändigt att koppla på strömmen efter det att hörlet är utlägsnats, utförda 3 Steg kontrollen och koppla sedan från ledarna till transformatorn primärsida. Se till att ledarna är isolerade från andra komponenter och chassiet. (Använd isoleringsband om det behövs). När du är färdigt utför du 3 Steg kontrollen och ansluter ledningarna till transformatorn primärsida igen.

KOM IHÅG ATT KONTROLLERA 4 STEG

- 1) Anslut alla ledningar som används vid testning
- 2) Sätt tillbaka ytterhöljet.
- 3) Anslut strömkällan på nytt.
- 4) Sätt på ugnen. Kontrollera alla funktioner.

Mikrovågsugnar får inte användas tomma. Kontrollera mikrovågsstrålningen i olika delar av ugnen genom att placera en kopp med kallt vatten på ugnens tallrik, stäng dörren, ställ in HIGH och ställ in 2 minuter på timern. När två minuter har gått (timern visar 0) kontrollerar du om vattnet är varmt. Om vattnet fortfarande är kallt utför du 3 steg kontrollen och kontrollerar anslutningarna till varje enskild komponent på nytt.

När all service är klar och ugnen är ihopskrubbad ska ugnens uteffekt och eventuellt mikrovågläckage kontrolleras.

SERVICING

1

I forni a microonde contengono un circuito elettrico in grado di generare tensioni e correnti estremamente elevate. L'eventuale contatto con i seguenti componenti può causare la folgorazione:
condensatore ad alta tensione; trasformatore ad alta tensione; magnetron; rettificatore alta tensione; cablaggio ad alta tensione.

TRE OPERAZIONI IMPORTANTI PER INCOMINCIARE

- 1) Scollegare l'alimentazione elettrica.
- 2) Verificare che la porta sia bloccata in posizione aperta.
- 3) Scaricare il condensatore ad alta tensione.

ATTENZIONE AL CONDENSATORE AD ALTA TENSIONE: PUO ESSERE CARICO

Il condensatore ad alta tensione rimane carico per circa 60 secondi dopo lo spegnimento del forno. Occorre quindi spettare 60 secondi prima di cortocircuitare, utilizzando un cacciavite con impugnatura isolata, il collegamento del condensatore ad alta tensione (cioè del conduttore di collegamento del raddrizzatore ad alta tensione) sul telaio del forno.

Sharp raccomanda, nei limiti del possibile, che la ricerca dei guasti avvenga in assenza di alimentazione elettrica. In alcuni casi tuttavia, può essere necessario alimentare l'apparecchio dopo aver rimosso la scatola esterna. In questo caso eseguire i tre controlli sopra citati e quindi scollegare i connettori dal primario del trasformatore. Assicurarsi che tali connettori non vengano a contatto con altri componenti, ne con il telaio del forno (fare uso, se necessario, di nastro isolante). Al termine dell'intervento, eseguire nuovamente i tre controlli e ricollegare i conduttori al primario del trasformatore.

QUATTRO VERIFICHE IMPORTANTI DA NON DIMENTICARE

- 1) Ricollegare tutti i conduttori staccati dai vari componenti durante l'intervento.
- 2) Rimontare la scatola esterna.
- 3) Ripristinare l'alimentazione elettrica.
- 4) Rimettere in funzione il forno. Controllare tutte le funzioni.

I forni a microonde non devono mai funzionare a vuoto. Per verificare la presenza di energia da microonde all'interno di una cavità, mettere una tazza di acqua fredda sul piatto rotante del forno, chiudere la porta, regolare la potenza su HIGH ed impostate il temporizzatore su due (2) minuti. Trascorsi i due minuti (temporizzatore a zero), controllare accuratamente che ora l'acqua sia calda. Se l'acqua è rimasta fredda, eseguire i tre controlli iniziali e verificare nuovamente i collegamenti del componente in questione.

Dopo aver portato a termine le operazioni di manutenzione e rimontato il forno, è necessario controllare la potenza delle microonde emesse ed eseguire un test per verificare che non vi sia alcuna dispersione.

When troubleshooting the microwave oven, it is helpful to follow the Sequence of Operation in performing the checks. Many of the possible causes of trouble will require that a specific test be performed. These tests are given a procedure letter which will be found in the "Test Procedure" section.

IMPORTANT: If the oven becomes inoperative because of a blown fuse F8A in the monitored latch switch - monitor switch circuit, check the monitored latch switch and monitor switch before replacing the fuse F8A.

CAUTION/WARNING

CAUTION MICROWAVE RADIATION

Service engineers should not be exposed to the microwave energy which may radiate from the magnetron or other microwave generating devices if it is improperly used or connected. All input and output microwave connections, waveguides, flanges and gaskets must be secured. Never operate the device without a microwave energy absorbing load attached. Never look into an open waveguide or antenna while the device is energized.

WARNING

Servicing and repair work must be carried out only by trained service engineers.

All the parts marked "*" on parts list are used at voltages more than 250V.

Removal of the outer wrap gives access to potentials above 250V.

All the parts marked "Δ" on parts list may cause undue microwave exposure, by themselves, or when they are damaged, loosened or removed.

WARNING

THIS APPLIANCE MUST BE EARTHED. THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

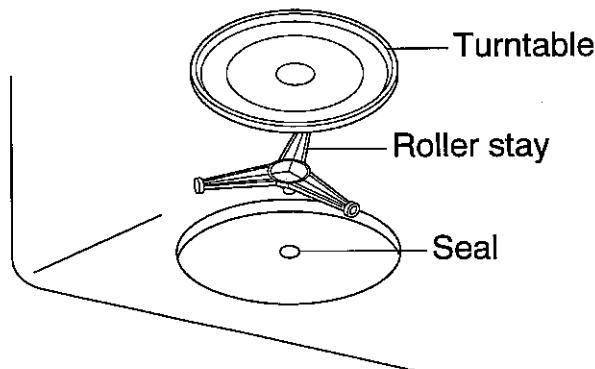
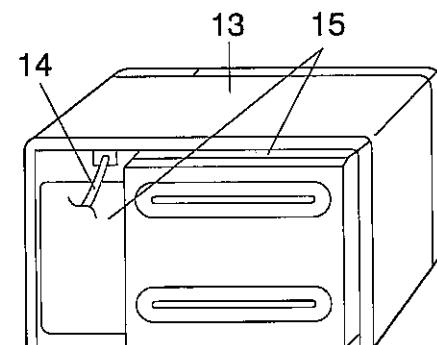
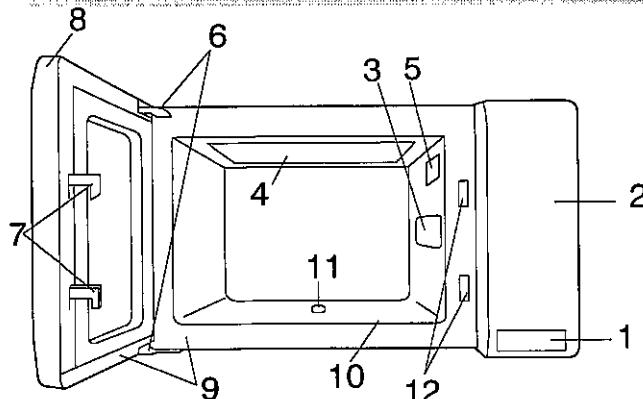
GREEN-AND-YELLOW : EARTH BLUE : NEUTRAL BROWN : LIVE

PRODUCT DESCRIPTION

SPECIFICATION

ITEM	DESCRIPTION
Power Requirements	230 Volts 50 Hertz Single phase, 3 wire earthed
Power Consumption	Microwave cooking 1350 W Approx. 6.0 A Grill Cooking 1050 W Approx. 4.6A
Power Output	800 W nominal of RF microwave energy (measured by method of IEC 705) Operating frequency 2450 MHz
Grill heating element Power Output (Top Grill)	1000 W (500 W x 2)
Bottom heating element Power Output	900W
Case Dimensions	Width 449 mm Height 282 mm including foot Depth 374 mm
Cooking Cavity Dimensions	Width 260 mm Height 194 mm Depth 313 mm
Turntable diameter	272 mm
Control Complement	Jog Touch Control System Microwave Power for Variable Cooking Repetition Rate; HIGH Full power throughout the cooking time MEDIUM HIGH approx. 70% of FULL Power MEDIUM approx. 50% of FULL Power MEDIUM LOW approx. 30% of FULL Power LOW approx. 10% of FULL Power AUTO COOK Button MICRO GRILL Button STOP/CLEAR Button AUTO MINUTE / START Button Time / Kg / % ROTARY Knob
Set Weight	Approx. 14 kg

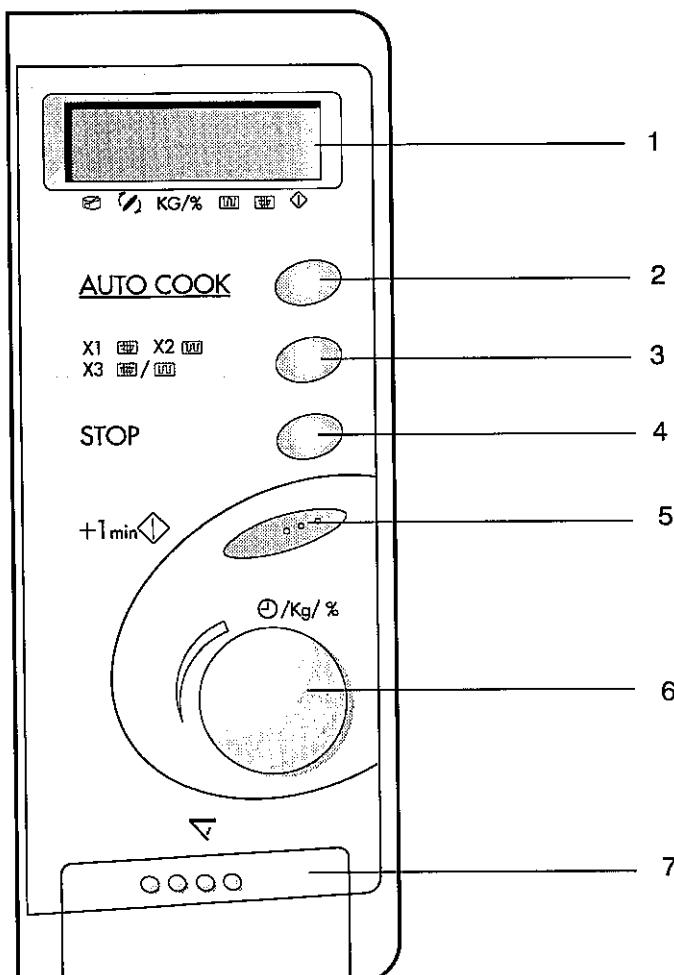
APPEARANCE VIEW



OVEN

- 1. Door open button
- 2. Control panel
- 3. Waveguide cover
- 4. Grill heating element
- 5. Oven lamp
- 6. Door hinges
- 7. Door safety latches
- 8. Door
- 9. Door seals and sealing surfaces
- 10. Oven cavity
- 11. Seal packing
- 12. Door lock openings
- 13. Outer cabinet
- 14. Power supply cord
- 15. Ventilation openings

CONTROL PANEL



- 1. Digital Display
- 2. AUTOCOOK button
- 3. MICROWAVE POWER LEVEL button
- 4. STOP button
- 5. START button
- 6. TIME / WEIGHT PORTION dial
- 7. DOOR OPEN button

OPERATION SEQUENCE

OFF CONDITION

Closing the door activates all door interlock switches (Monitored latch switch, and stop switch.)

IMPORTANT:

When the oven door is closed, the contacts COM-NC of the monitor switch must be open. When the microwave oven is plugged in a wall outlet (230V / 50Hz), the line voltage is supplied to the point A1 + A3 in the control unit.

Figure O-1 on page 30

1. The display flashes "88:88"
2. To set any programmes or set the clock, you must first touch the STOP pad.
3. ":" appears in display.

NOTE: When the oven door is opened, the oven lamp comes on at this time.

MICROWAVE COOKING CONDITION

HIGH COOKING

Enter a desired cooking time by turning the Timer knob and start the oven by touching START +1min  button.

Function sequence Figure O-2 on page 30

CONNECTED COMPONENTS	RELAY
Oven lamp, Fan motor, Turntable motor	RY1
High voltage transformer	RY2

1. 230 volts A.C. is supplied to the primary winding of the high voltage transformer. The voltage is converted to about 3.3 volts A.C. output on the filament winding and high voltage of approximately 2000 volts A.C. on the secondary winding.
2. The filament winding voltage (3.3 volts) heats the magnetron filament and the high voltage (2000 volts) is sent to the voltage doubling circuit, where it is doubled to negative voltage of approximately 4000 volts D.C..
3. The 2450 MHz microwave energy produced in the magnetron generates a wave length of 12.24 cm. This energy is channelled through the waveguide (transport channel) into the oven cavity, where the food is placed to be cooked.
4. When the cooking time is up, a signal tone is heard and the relays RY1 + RY2 go back to their home position. The circuits to the oven lamp, high voltage transformer, fan motor and turntable motor are cut off.
5. When the oven door is opened during a cooking cycle, the switches come to the following condition.

Switch	Contact	Condition	
		During Cooking	Oven Door Open (No cooking)
Monitored Latch Switch	COM-NO	Closed	Opened
Monitor Switch	COM-NC	Opened	Closed
Stop Switch	COM-NO	Closed	Opened

The circuit to the high voltage transformer, fan motor and turntable motor are cut off when the 1st latch switch, 2nd. latch switch and stop switch are made open. The oven lamp remains on even if the oven door is opened after the cooking cycle has been interrupted, because the relay RY1 stay closed. Shown in the display is remaining time.

6. MONITOR SWITCH CIRCUIT

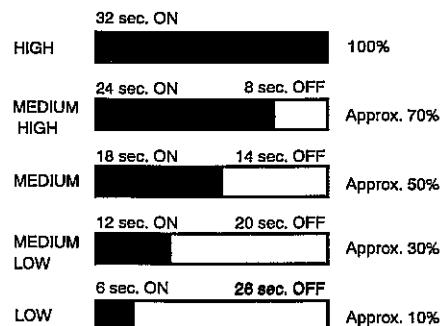
The monitor switch is mechanically controlled by the oven door, and monitors the operation of the monitored latch switch.

- 6-1. When the oven door is opened during or after the cycle of a cooking program, the monitored latch switch must open its contacts (COM-NO) first. After that the contacts (COM-NC) of the monitor switch can be opened and the contacts of stop switch can be opened.
- 6-2. When the oven door is closed, the contacts (COM-NC) of the monitor switch must be opened and the contacts (COM-NO) of the stop switch must be closed and the contacts (COM-NO) of stop switch must be closed first. After that the contacts of the monitored latch switch are closed.
- 6-3. When the oven door is opened and the contacts of the monitored latch switch remain closed, the fuse F8A will blow, because the monitor switch are closed and a short circuit is closed.

MEDIUM HIGH, MEDIUM, MEDIUM LOW, LOW COOKING

When the microwave oven is preset for variable cooking power, the 230 volts is supplied to the high voltage transformer intermittently within a 32-second time base through the relay contact which is coupled with the current-limiting relay RY2. The following levels of microwave power are given.

SETTING



Note: The On/Off time ratio does not exactly correspond to the percentage of microwave power, because approx. 2 seconds are needed for heating up the magnetron filament.

GRILL COOKING CONDITION (Figure O-3)

In this condition the food is cooked by grill heating element energy. Program desired cooking time and grill mode by turning the timer knob and touching mode select button twice (x2 ). When the START +1min  button is touched, the following operations occur:

1. The numbers of the digital readout start the count down to zero.
2. The oven lamp, cooling fan motor and turntable motor are energized.
3. The relay RY3 is energized and the grill heating elements are energized.
4. Now, the food is grilled by the grill heating elements.

OPERATION SEQUENCE

AUTO COOK programme

Keep on touching the AUTO COOK button until the desired cooking programme appears in the display. Enter weight or quantity of food by rotating the TIMER/WEIGHT/POWER knob until the desired weight/quantity is displayed.

Once the oven starts, it will cook according to the computer programmed sequence.

COMBI GRILL COOKING CONDITION

Program desired cooking time and select COMBI GRILL mode and programme microwave power level. When the START pad is touched, the following operations occur:

1. The numbers of the digital read-out start the count down to zero.
2. The shut-off relay (RY1) energised, turning on the oven lamp, turntable motor and cooling fan motor.

3. The power supply voltage is added to the grill heater and power transformer alternately.
4. The grill heater operates through the heater relay (RY1) contacts and the high voltage transformer operates through the cook relay (RY2) contacts.
5. These are operated by the CPU unit to supply alternately within a 32 second time base, grill heat and microwave energy.

NOTE: The ON and OFF time ratio does not correspond with the percentage of microwave power, because approx. 2 seconds are needed for heating of the magnetron filament.

FUNCTION OF IMPORTANT COMPONENTS

DOOR OPEN MECHANISM

The door can be opened by pushing the open button on the control panel. When the open button is pushed, the open lever pushes lower latch head on the door upward. The latch head is linked with the lower latch head, so now, the door can be opened.

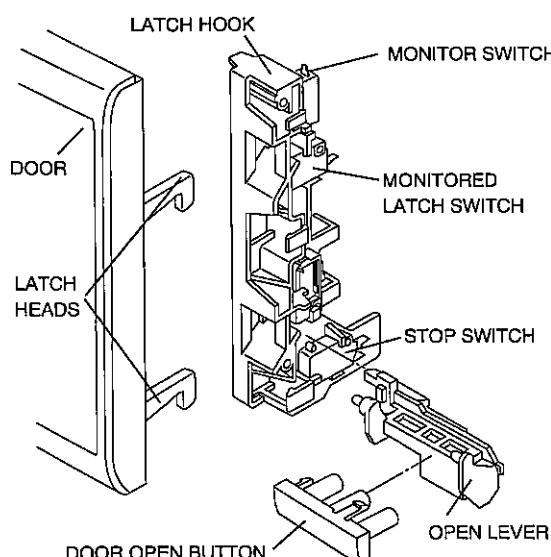


Figure D-1. Door Open Mechanism

LATCH SWITCH AND STOP SWITCH

1. When the oven door is closed, the contacts (COM-NO) of each switch must be closed.
2. When the oven door is opened, the contacts (COM-NO) of each switch must be opened.

FUSE F8A 250V

1. If the wire harness or electrical components are short-circuited, this fuse blows to prevent an electric shock or fire hazard.
2. The fuse also blows when monitored latch switch remains closed with the oven door open and when the monitor switch contact (COM-NC) closes.
3. The fuse also blows when the asymmetric rectifier, H.V. rectifier, H.V. wire harness, H.V. capacitor, magnetron or secondary winding of high voltage transformer is shorted.

THERMAL CUT-OUT 150°C (OVEN)

The thermal cut-out protects the oven against the over heat during grill cooking or combi grill cooking. If the temperature rises above 150°C because the fan motor is interrupted, the air inlet duct is blocked or the ventilation openings are obstructed, the thermal cut-out opens and switches off the all electrical parts. The defective thermal cut-out must be replaced with new rated one.

THERMAL CUT-OUT 150°C (MG)

This thermal cut-out protects the magnetron against overheating. If the temperature goes up higher than 150°C because the fan motor is interrupted or the ventilation openings are blocked, the thermal cut-out will open and line voltage to the high voltage transformer will cut off and operation of the magnetron will be stopped. The defective thermal cut-out must be replaced with a new one.

FUNCTION OF IMPORTANT COMPONENTS

MONITOR SWITCH

The monitor switch is activated (the contacts opened) by the latch head on the door while the door is closed. The switch is intended to render the oven inoperative by means of blowing the fuse F8A when the contacts of the 1st latch switch fail to open when the door is opened.

Function

1. When the door is opened, the contacts (COM-NC) of monitor switch close (to the ON condition) due to their being normally closed and contacts (COM-NO) open. At this time the latch switch is in the OFF condition (contacts open) due to their being normally open contact switches.
2. As the door goes to a closed position, the monitor switch contacts (COM-NC) are opened and stop switch contacts (COM-NO) are closed. And then contacts of the latch switch closed. (On opening the door, each of these switches operate inversely.)
3. If the door is opened and the latch switch contacts fail to open, the fuse F8A blows immediately after closing of the monitor switch (COM-NC) contacts.

CAUTION: BEFORE REPLACING A BLOWN FUSE F8A TEST THE LATCH, MONITOR SWITCH AND MONITOR RESISTOR FOR PROPER OPERATION. (REFER TO CHAPTER "TEST PROCEDURE").

GRILL HEATING ELEMENT GH

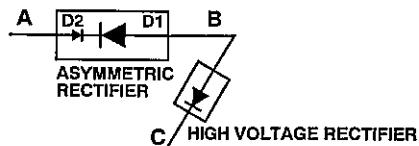
The grill heating element is provided to brown the food and is located on the top of the oven cavity.

NOISE FILTER

The noise filter assembly prevents radio frequency interference that might flow back in the power circuit.

ASYMMETRIC RECTIFIER

The asymmetric rectifier is a solid state device that prevents current flow in both directions. And it prevents the temperature rise of the high voltage transformer by blowing the fuse F8A when the high voltage rectifier is shorted.



The rated peak reverse voltage of D1 of the asymmetric rectifier is 6 KV. The rated peak reverse voltage of D2 of the asymmetric rectifier is 1.7 KV. D1 and D2 of the asymmetric rectifier or high voltage rectifier are shorted when the each peak reverse voltage goes beyond the each rated peak reverse voltage. (The process of blowing the fuse F8A.)

1. The high voltage rectifier is shorted by some fault when microwave cooking.
2. The peak reverse voltage of D2 of the rectifier goes beyond the rated peak reverse voltage 1.7 KV in the voltage doubler circuit.
3. D2 of the rectifier is shorted.
4. The large electric currents flow through the high voltage winding of the high voltage transformer.
5. The large electric currents beyond F8A flow through the primary winding of the high voltage transformer.
6. The fuse F8A blows by the large electric currents.
7. The power supply to the high voltage transformer is cut off.

TURNTABLE MOTOR TTM

The turntable motor drives the roller stay to rotate the turntable.

FAN MOTOR FM

The fan motor drives a blade which draws external cool air. This cool air is directed through the air vanes surrounding the magnetron and cools the magnetron. This air is channelled through the oven cavity to remove steam and vapours given off from the heating foods. It is then exhausted through the exhausting air vents at the oven cavity.

TEST PROCEDURES

TEST PROCEDURE		A	B	C	D	E	E	E	F	F	G	G	H	I	J	
CONDITION	PROBLEM	MAGNETRON	HIGH VOLTAGE TRANSFORMER	H.V. RECTIFIER ASSEMBLY	H.V. HARNESS	HIGH VOLTAGE CAPACITOR	1ST LATCH SWITCH	STOP SWITCH	MONITOR SWITCH	MONITOR RESISTOR	THERMAL CUT-OUT 150°C (MG.)	THERMAL CUT-OUT 150°C (OVEN)	TURNTABLE MOTOR	FAN MOTOR	NOISE FILTER	
OFF CONDITION	Fuse F8A blows when the door is opened.						○								○	
	Home fuse blows when power cord is plugged into wall outlet.														○	
	"88:88" does not appear in display when power cord is plugged into wall outlet.										○	○			○	
	Display does not operate properly when STOP button is touched.							○							○	
	Oven lamp does not light when door is opened. (Display operates.)						○	○							○	
COOKING CONDITION (COMMON MODE)	Oven does not start when the START button is touched. (Display operates.)							○								
	Fan motor does not operate. (Oven lamp lights.)												○	○		
	Turntable motor does not operate. (Oven lamp lights.)										○					
	Oven or any electrical parts does not stop when cooking time is 0 or STOP button is touched.															
	Display operates properly but all electrical parts do not operate.															
	Oven goes into cook cycle but shuts down before end of cooking cycle.									○	○	○	○			
MICROWAVE COOKING CONDITION	Oven seems to be operating but little or no heat is produced in oven load. (Microwave power control is set at HIGH)	○	○	○	○	○	○									
	Oven does not seem to be operating properly during variable cooking condition. (Oven operates properly at HIGH)															
GRILL COOKING CONDITION	Grill heating element does not heat. (Oven seems to be operating.)						○							○		
COMBI-GRILL COOKING CONDITION	Fuse M8A blows															

TEST PROCEDURES

TEST PROCEDURES

PROCEDURE LETTER

COMPONENT TEST

A MAGNETRON TEST

NEVER TOUCH ANY PART IN THE CIRCUIT WITH YOUR HAND OR AN INSULATED TOOL WHILE THE OVEN IS IN OPERATION.

CARRY OUT 3D CHECKS.

Isolate the magnetron from high voltage circuit by removing all leads connected to filament terminal.

To test for an open circuit filament use an ohmmeter to make a continuity test between the magnetron filament terminals, the meter should show a reading of less than 1 ohm.

To test for short filament to anode condition, connect ohmmeter between one of the filament terminals and the case of the magnetron (ground). This test should be indicated an infinite resistance. If a low or zero resistance reading is obtained then the magnetron should be replaced.

MICROWAVE OUTPUT POWER (IEC-705-1988)

The following test procedure should be carried out with the microwave oven in a fully assembled condition (outer case fitted). Microwave output power from the magnetron can be measured by way of IEC 705, i.e. it is measured by how much power the water load can absorb. To measure the microwave output power in the microwave oven, the relation of calorie and watt is used. When $P(W)$ heating works for t (second), approximately $P \times t / 4.187$ calorie is generated. On the other hand, if the temperature of the water with $V(\text{ml})$ rises ΔT ($^{\circ}\text{C}$) during this microwave heating period, the calorie of the water is $V \times \Delta T$.

The formula is as follows;

$$P \times t / 4.187 = V \times \Delta T \quad P (\text{W}) = 4.187 \times V \times \Delta T / t$$

Our condition for water load is as follows:

Room temperature around 20°C

Water load 1000 g

Heating time 52 sec.

$$P = 75 \times \Delta T$$

Power supply Voltage Rated voltage

Initial temperature $10 \pm 2^{\circ}\text{C}$

Measuring condition:

1. Container

The water container must be a cylindrical borosilicate glass vessel having a maximum material thickness of 3 mm and an outside diameter of approximately 190 mm.

2. Temperature of the oven and vessel

The oven and the empty vessel are at ambient temperature prior to the start the test.

3. Temperature of the water

The initial temperature of the water is $(10 \pm 2)^{\circ}\text{C}$.

4. Select the initial and final water temperature so that the maximum difference between the final water temperature and the ambient temperature is 5K.

5. Select stirring devices and measuring instruments in order to minimize addition or removal of heat.

6. The graduation of the thermometer must be scaled by 0.1°C at minimum and be an accurate thermometer.

7. The water load must be (1000 ± 5) g.

8. "t" is measured while the microwave generator is operating at full power. Magnetron filament heat-up time is not included.

NOTE: The operation time of the microwave oven is "t + 2" sec. (2 sec. is magnetron filament heat-up time.)
Therefore total heating time = 54 sec.

TEST PROCEDURES

PROCEDURE LETTER

COMPONENT TEST

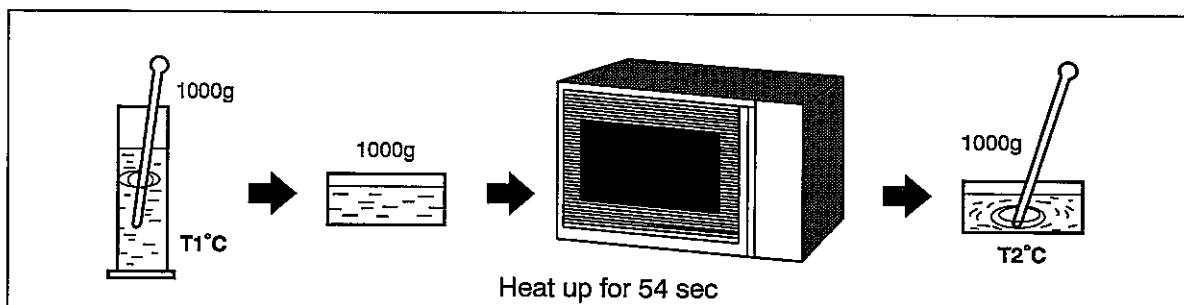
Measuring method:

1. Measure the initial temperature of the water before the water is added to the vessel.
(Example: The initial temperature $T_1 = 11^\circ\text{C}$)
2. Add the 1 litre water to the vessel.
3. Place the load on the centre of the shelf.
4. Operate the microwave oven at HIGH for the temperature of the water rises by a value ΔT of $(10 \pm 2) \text{ K}$.
5. Stir the water to equalize temperature throughout the vessel.
6. Measure the final water temperature. (Example: The final temperature $T_2 = 21^\circ\text{C}$)
7. Calculate the microwave power output P in watts from above formula.

Initial temperature.....	$T_1 = 11^\circ\text{C}$
Temperature after $(52 + 2) = 54 \text{ sec.}$	$T_2 = 21^\circ\text{C}$
Temperature difference Cold-Warm	$\Delta T_1 = 10^\circ\text{C}$
Measured output power	
The equation is " $P = 80 \times \Delta T$ "	$P = 80 \times 10^\circ\text{C} = 800 \text{ Watts}$

JUDGMENT: The measured output power should be at least $\pm 15\%$ of the rated output power.

CAUTION: 1°C CORRESPONDS TO 75 WATTS. REPEAT MEASUREMENT IF THE POWER IS INSUFFICIENT.



B

HIGH VOLTAGE TRANSFORMER TEST

WARNING: High voltage and large currents are present at the secondary winding and filament winding of the high voltage transformer. It is very dangerous to work near this part when the oven is on. NEVER make any voltage measurements of the high-voltage circuits, including the magnetron filament.

CARRY OUT 3D CHECKS.

Disconnect the leads to the primary winding of the high voltage transformer. Disconnect the filament and secondary winding connections from the rest of the HV circuitry. Using an ohmmeter, set on a low range, it is possible to check the continuity of all three windings. The following readings should be obtained:-

a. Primary winding	approximately 2.22 ohms
b. Secondary winding	approximately 120 ohms
c. Filament winding	less than 1 ohm

If the readings obtained are not stated as above, then the high voltage transformer is probably faulty and should be replaced.

CARRY OUT 4R CHECKS.

TEST PROCEDURES

PROCEDURE LETTER

COMPONENT TEST

C HIGH VOLTAGE RECTIFIER ASSEMBLY TEST

HIGH VOLTAGE RECTIFIER TEST

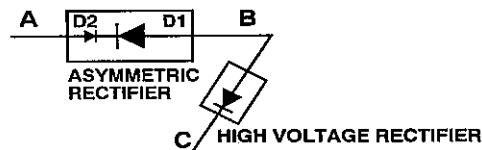
CARRY OUT 3D CHECKS.

Isolate the high voltage rectifier assembly from the HV circuit. The high voltage rectifier can be tested using an ohmmeter set to its highest range. Connect the ohmmeter across the terminal B+C of the high voltage rectifier and note the reading obtained. Reverse the meter leads and note this second reading. The normal resistance is infinite in one direction and more than 100 kΩ in the other direction.

CARRY OUT 4R CHECKS.

ASYMMETRIC RECTIFIER TEST

CARRY OUT 3D CHECKS.



Isolate the high voltage rectifier assembly from the HV circuit. The asymmetric can be tested using an ohmmeter set to its highest range across the terminals A+B of the asymmetric rectifier and note the reading obtained. Reverse the meter leads and note this second reading. If an open circuit is indicated in both direction then the asymmetric rectifier is good. If an asymmetric rectifier is shorted in either direction, then the asymmetric rectifier is probably faulty and must be replaced with high voltage rectifier. When the asymmetric rectifier is defective, check whether magnetron, high voltage rectifier, high voltage wire or filament winding of the high voltage transformer is shorted.

CARRY OUT 4R CHECKS.

NOTE: FOR MEASUREMENT OF THE RESISTANCE OF THE RECTIFIER, THE BATTERIES OF THE MEASURING INSTRUMENT MUST HAVE A VOLTAGE AT LEAST 6 VOLTS, BECAUSE OTHERWISE AN INFINITE RESISTANCE MIGHT BE SHOWN IN BOTH DIRECTIONS.

D HIGH VOLTAGE CAPACITOR TEST

CARRY OUT 3D CHECKS

- Isolate the high voltage capacitor from the circuit.
- Continuity check must be carried out with measuring instrument which is set to the highest resistance range.
- A normal capacitor shows continuity for a short time (kick) and then a resistance of about 10MΩ after it has been charged.
- A short-circuited capacitor shows continuity all the time.
- An open capacitor constantly shows a resistance about 10 MΩ because of its internal 10MΩ resistance.
- When the internal wire is opened in the high voltage capacitor shows an infinite resistance.
- The resistance across all the terminals and the chassis must be infinite when the capacitor is normal.

If incorrect reading are obtained, the high voltage capacitor must be replaced.

CARRY OUT 4R CHECKS.

E SWITCH TEST

CARRY OUT 3D CHECKS.

Isolate the switch to be tested and using an ohmmeter check between the terminals as described in the following table.

Table: Terminal Connection of Switch

Plunger Operation	COM to NO	COM to NC
Released	O.C.	S.C.
Depressed	S.C.	O.C.

COM; Common terminal,
NO; Normally open terminal
NC; Normally close terminal
S.C.; Short circuit
O.C.; Open circuit

If incorrect readings are obtained, make the necessary switch adjustment or replace the switch.

CARRY OUT 4R CHECKS.

TEST PROCEDURES

PROCEDURE LETTER

COMPONENT TEST

F THERMAL CUT-OUT TEST

CARRY OUT 3D CHECKS

Disconnect the leads from the terminals of the thermal cut-out. Then using an ohmmeter, make a continuity test across the two terminals as described in the below.

Table: Thermal Cut-out Test

Parts Name	Temperature of "ON" condition (closed circuit). (°C)	Temperature of "OFF" condition (open circuit). (°C)	Indication of ohmmeter (When room temperature is approx. 20°C.)
Thermal cut-out 150°C	This is not resettable type.	Above 150°C	Closed circuit

If incorrect readings are obtained, replace the thermal cut-out.

An open circuit thermal cut-out (MG) indicates that the magnetron has overheated, this may be due to restricted ventilation, cooling fan failure.

An open circuit thermal cut-out (OVEN) indicates that the oven cavity has overheated, this may be due to no load operation.

CARRY OUT 4R CHECKS.

G MOTOR WINDING TEST

CARRY OUT 3D CHECKS.

Disconnect the leads from the motor. Using an ohmmeter, check the resistance between the two terminals as described in the table below.

Table: Resistance of Motor

Motors	Resistance
Fan motor	Approximately 373 Ω
Turntable motor	Approximately 15.5 kΩ

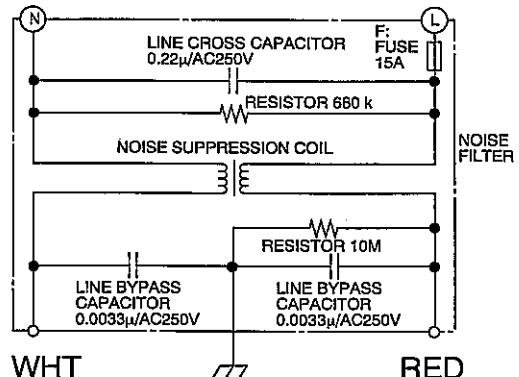
If incorrect readings are obtained, replace the motor.

CARRY OUT 4R CHECKS.

H NOISE FILTER TEST

CARRY OUT 3D CHECKS.

Disconnect the leads from the terminals of noise filter. Using an ohmmeter, check between the terminals as described in the following table.



MEASURING POINTS	INDICATION OF OHMMETER
Between N and L	Approx. 680 kΩ
Between terminal N and WHITE	Short circuit
Between terminal L and RED	Short circuit

If incorrect readings are absorbed, replace the noise filter unit.

CARRY OUT 4R CHECKS.

TEST PROCEDURES

PROCEDURE LETTER

COMPONENT TEST

I BLOWN FUSE F8A

CARRY OUT 3D CHECKS.

1. If the fuse F8A is blown when the door is opened, check the 1st latch switch and monitor switch.
2. If the fuse F8A is blown by incorrect door switching replace the defective switch(es) and the fuse F8A.
3. If the fuse F8A is blown, there is a short in the asymmetric rectifier or there is a ground in wire harness. A short in the asymmetric rectifier may be occurred due to short or ground in H.V. rectifier, magnetron, high voltage transformer or H.V. wire. Check them and replace the defective parts or repair the wire harness.
4. If the fuse F8A is blown, there could be a shorts or grounds in electrical parts or wire harness. Check them and replace the defective parts or repair the wire harness.

CARRY OUT 4R CHECKS.

CAUTION: Only replace fuse F8A with the correct value replacement.

J GRILL HEATING ELEMENT TEST

CARRY OUT 3D CHECKS

Before carrying out the following tests make sure the heating element is cool completely.

1. Resistance of heating element.

Disconnect the wire leads to the heating element to be tested. Using ohmmeter with low resistance range. Check the resistance across the terminals of the heating element as described in the following table.

Table: Resistance of heating element

Parts name	Resistance
Grill heating element	Approximately $25.6\ \Omega \times 2 = 51.2\ \Omega$

2. Insulation resistance.

Disconnect the wire leads to the heating element to be tested. Check the insulation resistance between the element terminal and cavity using a 500V - 100MΩ insulation tester. The insulation resistance should be more than 10 MΩ in the cold start.

If the results of above test 1 and/or 2 are out of above specifications, the heating element is probably faulty and should be replaced.

CARRY OUT 4R CHECKS.

CARRY OUT 3D CHECKS.

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST
K	<u>TOUCH CONTROL PANEL ASSEMBLY TEST</u> The touch control panel consists of circuits including semiconductors such as LSI, ICs, etc. Therefore, unlike conventional microwave ovens, proper maintenance can not be performed with only a voltmeter and ohmmeter. In this service manual, the touch control panel assembly is in one unit and troubleshooting by unit replacement is described according to the symptoms indicated. Control Panel. The following symptoms indicate a defective control unit. 1. Tact Switch. The following symptoms indicate a defective tact switch. Replace the tact switch. a) When touching a tact switch, a certain tact switch produces no signal at all. b) When touching a tact switch, sometimes a tact switch produces no signal. 2. In connection with tact switches. a) When touching a tact switch, a certain group of tact switch do not produce a signal. b) When touching a tact switch, no tact switch produce a signal. 3. Display problems. a) At a certain digit, all or some segments do not light up. b) At a certain digit, brightness is low. c) Only one indicator does not light up. d) The corresponding segments of all digits do not light up; or they continue to light up. e) Wrong figure appears. f) A certain group of indicators do not light up. g) The figure of all digits flicker. h) When touching a tact switch, the control unit does not respond. 4. Other possible problems caused by defective control unit. a) Buzzer does not sound or continues to sound. b) Cooking is not possible.
L	<u>TACT SWITCH TEST</u> 1. Disconnect the oven from the power supply. 2. Discharge the high voltage capacitor. 3. Remove the control unit from the control panel. 4. By using an ohmmeter, check the tact switch operation. 5. When the tact switch is not depressed, an ohmmeter should indicate an open circuit. When the tact switch is depressed, an ohmmeter should indicate a short circuit. If improper operation is indicated, the tact switch is probably defective and should be checked.
M	<u>RELAY TEST</u> Remove the outer case and check voltage between Pin No. 1 and Pin No. 3 of the 3 pin connector (A) on the control unit with an A.C. voltmeter. The meter should indicate rated voltage, if not check oven circuit. RY1, RY2 and RY3 Relay Test These relays are operated by D.C. voltage Check voltage at the relay coil with a D.C. voltmeter during the microwave cooking operation. DC. voltage indicated Defective relay. DC. voltage not indicated Check diode which is connected to the relay coil. If diode is good, control unit is defective.

RELAY SYMBOL	OPERATIONAL VOLTAGE	CONNECTED COMPONENTS
RY1	Approx. 24.0V D.C.	Oven lamp / Turntable motor / Cooling fan motor
RY2	Approx. 18.0V D.C.	Heating element
RY3	Approx. 18.0V D.C.	High voltage transformer

TEST PROCEDURES

PROCEDURE LETTER

COMPONENT TEST

N

PROCEDURES TO BE TAKEN WHEN THE FOIL PATTERN ON THE PRINTED WIRING BOARD (PWB) IS OPEN

To protect the electronic circuits, this model is provided with a fine foil pattern added to the primary on the PWB, this foil pattern acts as a fuse. If the foil pattern is open, follow the troubleshooting guide given below for repair.

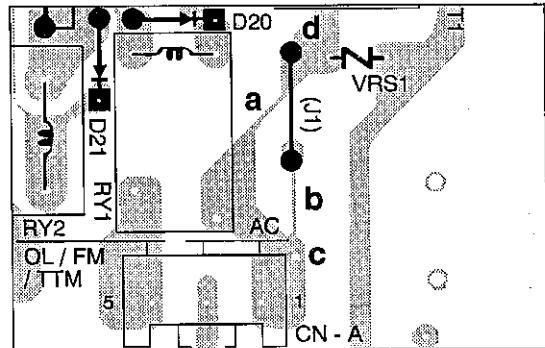
Problem: POWER ON, indicator does not light up.

CARRY OUT 3D CHECKS.

STEPS	OCCURRENCE	CAUSE OR CORRECTION
1	The rated AC voltage is not present at POWER terminal of CPU connector (CN-A).	Check supply voltage and oven power cord.
2	The rated AC voltage is present at primary side of low voltage transformer.	Low voltage transformer or secondary circuit defective. Check and repair.
3	Only pattern at "a" is broken.	*Insert jumper wire J1 and solder. (CARRY OUT 3D CHECKS BEFORE REPAIR)
4	Pattern at "a" and "b" are broken.	*Insert the coil RCILF2003YAZZ between "c" and "d". (CARRY OUT 3D CHECKS BEFORE REPAIR)

NOTE: *At the time of these repairs, make a visual inspection of the varistor for burning damage and examine the transformer with tester for the presence of layer short-circuit (check primary coil resistance). If any abnormal condition is detected, replace the defective parts.

CARRY OUT 4R CHECKS.



TOUCH CONTROL

OUTLINE OF TOUCH CONTROL PANEL

The touch control section consists of the following units as shown in the touch control panel circuit.

- (1) Key Unit
- (2) Control Unit

The principal functions of these units and the signals communicated among them are explained below.

Key Unit

The key unit is composed of a matrix, signals generated in the LSI are sent to the key unit through R10-R13 and R20. When a key pad is touched, a signal is completed through the key unit and passed back to the LSI through R00-R03 to perform the function that was requested.

Control Unit

Control unit consists of LSI, power source circuit, synchronizing signal circuit, ACL circuit, buzzer circuit and indicator circuit.

1) LSI

This LSI controls the key strobe signal, relay driving signal for oven function and indicator signal.

2) Power Source Circuit

This circuit generates voltages necessary in the control unit.

Symbol	Voltage	Application
VC	-5V	LSI(IC1)
VP	-26V	Fluorescent display tube : Grid and anode voltage
VF1	2.2Vac	Filament of fluorescent display tube
VF2		(VF1 to VF2 voltage)

3) Synchronizing Signal Circuit

The power source synchronizing signal is available in order to compose a basic standard time in the clock circuit. It accompanies a very small error because it works on commercial frequency.

4) ACL Circuit

A circuit to generate a signals which resets the LSI to the initial state when power is supplied.

5) Buzzer Circuit

The buzzer is responsive to signals from the LSI to emit audible sounds (key touch sound and completion sound).

6) Door Sensing Switch

A switch to "tell" the LSI if the door is open or closed.

7) Relay Circuit

To drive the magnetron, fan motor, turntable motor, grill heating element and light the oven lamp.

8) Indicator Circuit

Indicator element is a Fluorescent Display. Basically, a Fluorescent Display is triode having a cathode, a grid and an anode. Usually, the cathode of a Fluorescent Display is directly heated and the filament serves as cathode.

The Fluorescent Display has 6-digits, 13-segments are used for displaying figures.

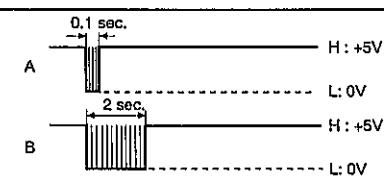
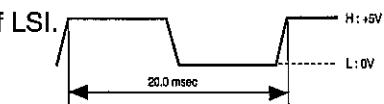
TOUCH CONTROL

DESCRIPTION OF LSI

LSI(IZA795DR)

The I/O signal of the LSI(IZA795DR) are detailed in the following table.

Pin No.	Signal	I/O	Description
1-3	SEG21-SEG23	OUT	Terminal not used.
4	COM1	OUT	Common data signal: COM1. Connected to LCD (Pin No. 1)
5	COM2	OUT	Common data signal: COM2. Connected to LCD (Pin No. 2)
6	COM3	OUT	Common data signal: COM1. Connected to LCD (Pin No. 3)
7	COM4	OUT	Terminal not used.
8	VLC	IN	Signal synchronized with commercial power source frequency. Signal similar to VSS.
9	VSS	IN	Power source voltage: 0V. VSS voltage of power source circuit input.
10	XIN	IN	Internal clock oscillation frequency setting input. The internal clock frequency is set by inserting the ceramic filter oscillation circuit with respect to XOUT terminal.
11	XOUT	OUT	Internal clock oscillation frequency control output. Output to control oscillation input of XIN.
12-15	K00-K03	IN	Terminal to change functions according to the Model. DC voltage in accordance with the Model in operation is applied to set up its function.
16	TEST	IN	Connected to VC.
17	RESET	IN	Auto clear terminal. Signal is input to reset the LSI to the initial state when power is supplied. Temporarily set to "L" level the moment power is supplied, at this time the LSI is reset. Thereafter set at "H" level.
18	HOLD	IN/OUT	Connected to VDD.
19	INT2	IN	Signal synchronized with commercial power source frequency. This is the basic timing for time processing of LSI.
20	R81	IN	Signal coming from encoder. When the encoder is turned, the contacts of encoder make pulse signals. And pulse signals are input into R81.
21	INT1	IN	Signal coming from encoder. Signal similar to R81. Pulse signals are input into INT1.
22	R83	OUT	Terminal not used.
23	R90	IN	To input signal which communicates the door open/close information to LSI. Door open "L" level signal (0V). Door close "H" level (+5V)
24-25	R91-R92	OUT	Terminal not used.
26	VDD	IN	Connected to GND.
27	R40	OUT	Signal to sound buzzer (2.0 kHz). A: key touch sound. B: Completion sound.



TOUCH CONTROL

Pin No.	Signal	I/O	Description																																				
28	R41	OUT	<p>Grill heating element driving signal. To turn on and off the grill heating element relay (RY2). "L" level during grill cooking or dual cooking; "H" level otherwise.</p>																																				
29	R42	OUT	<p>Magnetron high-voltage circuit driving signal. To turn on and off the cook relay (RY3). In 100% POWER operation, the signals hold "L" level during microwave cooking and "H" level while not cooking. In other cooking modes (70%, 50%, 30%, 10%) the signal turns to "H" level and "L" level in repetition according to the power level.</p> <p>ON/OFF time ratio in Micro cooking (a. 32second time base)</p> <table border="1"> <thead> <tr> <th>MICRO COOK</th> <th>ON</th> <th>OFF</th> </tr> </thead> <tbody> <tr> <td>100%</td> <td>32sec.</td> <td>0sec.</td> </tr> <tr> <td>70%</td> <td>24sec.</td> <td>8sec.</td> </tr> <tr> <td>50%</td> <td>18sec.</td> <td>14sec.</td> </tr> <tr> <td>30%</td> <td>12sec.</td> <td>20sec.</td> </tr> <tr> <td>10%</td> <td>6sec.</td> <td>26sec.</td> </tr> </tbody> </table> <p>ON/OFF time ratio in Micro cooking (a. 48second time base)</p> <table border="1"> <thead> <tr> <th>MICRO COOK</th> <th>ON</th> <th>OFF</th> </tr> </thead> <tbody> <tr> <td>100%</td> <td>48sec.</td> <td>0sec.</td> </tr> <tr> <td>70%</td> <td>36sec.</td> <td>12sec.</td> </tr> <tr> <td>50%</td> <td>26sec.</td> <td>22sec.</td> </tr> <tr> <td>30%</td> <td>16sec.</td> <td>32sec.</td> </tr> <tr> <td>10%</td> <td>8sec.</td> <td>40sec.</td> </tr> </tbody> </table>	MICRO COOK	ON	OFF	100%	32sec.	0sec.	70%	24sec.	8sec.	50%	18sec.	14sec.	30%	12sec.	20sec.	10%	6sec.	26sec.	MICRO COOK	ON	OFF	100%	48sec.	0sec.	70%	36sec.	12sec.	50%	26sec.	22sec.	30%	16sec.	32sec.	10%	8sec.	40sec.
MICRO COOK	ON	OFF																																					
100%	32sec.	0sec.																																					
70%	24sec.	8sec.																																					
50%	18sec.	14sec.																																					
30%	12sec.	20sec.																																					
10%	6sec.	26sec.																																					
MICRO COOK	ON	OFF																																					
100%	48sec.	0sec.																																					
70%	36sec.	12sec.																																					
50%	26sec.	22sec.																																					
30%	16sec.	32sec.																																					
10%	8sec.	40sec.																																					
30	R43	OUT	<p>Oven lamp, fan motor and turntable motor driving signal. To turn on and off shut off relay (RY1). The square waveform voltage is delivered to the RY1 driving circuit.</p>																																				
31-33	R50-R52	OUT	Terminal not used.																																				
34	R53	IN	<p>Signal coming from tact switch. When either of tact switches SW60-SW63 is touched, a corresponding signal out of R60, R61, R62 and R63 will be input into R53. When no key is touched, the signal is held at "H" level.</p>																																				
35	R60	OUT	<p>Tact switch strobe signal. Signal applied to tact switch section. A pulse signal is input to R53 terminal while the tact switch SW60 is touched.</p>																																				
36	R61	OUT	<p>Tact switch strobe signal. Signal applied to tact switch section. A pulse signal is input to R53 terminal while the tact switch SW61 is touched.</p>																																				
37	R62	OUT	<p>Tact switch strobe signal. Signal applied to tact switch section. A pulse signal is input to R53 terminal while the tact switch SW62 is touched.</p>																																				
38	R63	OUT	<p>Tact switch strobe signal. Signal applied to tact switch section. A pulse signal is input to R53 terminal while the tact switch SW63 is touched.</p>																																				
39-42	R70-R73	OUT	Terminal not used.																																				
43-54	SEG0 - SEG11	OUT	<p>Segment data signal. Connected to LCD. The relation between signals are as follows:</p> <table> <thead> <tr> <th>LSI signal (Pin No.)</th> <th>LCD (Pin No.)</th> <th>LSI signal (Pin No.)</th> </tr> </thead> <tbody> <tr> <td>SEG 0 (1)</td> <td>S12(4)</td> <td>SEG 6 (7)</td> <td>S6(10)</td> </tr> <tr> <td>SEG 1 (2)</td> <td>S11(5)</td> <td>SEG 7 (8)</td> <td>S5(11)</td> </tr> <tr> <td>SEG 2 (3)</td> <td>S10(6)</td> <td>SEG 8 (9)</td> <td>S4(12)</td> </tr> <tr> <td>SEG 3 (4)</td> <td>S9(7)</td> <td>SEG 9 (10)</td> <td>S3(13)</td> </tr> <tr> <td>SEG 4 (5)</td> <td>S8(8)</td> <td>SEG 10 (11)</td> <td>S2(14)</td> </tr> <tr> <td>SEG 5 (6)</td> <td>S7(9)</td> <td>SEG 11 (12)</td> <td>S1(15)</td> </tr> </tbody> </table>	LSI signal (Pin No.)	LCD (Pin No.)	LSI signal (Pin No.)	SEG 0 (1)	S12(4)	SEG 6 (7)	S6(10)	SEG 1 (2)	S11(5)	SEG 7 (8)	S5(11)	SEG 2 (3)	S10(6)	SEG 8 (9)	S4(12)	SEG 3 (4)	S9(7)	SEG 9 (10)	S3(13)	SEG 4 (5)	S8(8)	SEG 10 (11)	S2(14)	SEG 5 (6)	S7(9)	SEG 11 (12)	S1(15)									
LSI signal (Pin No.)	LCD (Pin No.)	LSI signal (Pin No.)																																					
SEG 0 (1)	S12(4)	SEG 6 (7)	S6(10)																																				
SEG 1 (2)	S11(5)	SEG 7 (8)	S5(11)																																				
SEG 2 (3)	S10(6)	SEG 8 (9)	S4(12)																																				
SEG 3 (4)	S9(7)	SEG 9 (10)	S3(13)																																				
SEG 4 (5)	S8(8)	SEG 10 (11)	S2(14)																																				
SEG 5 (6)	S7(9)	SEG 11 (12)	S1(15)																																				
55-57	SEG12-SEG14	OUT	Terminal not used.																																				
58	VDD	IN	<p>Power source voltage input terminal. Connected to GND.</p>																																				
59-64	SEG15-SEG20	OUT	Terminal not used.																																				

TOUCH CONTROL

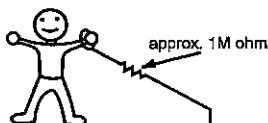
SERVICING

1. Precautions for Handling Electronic Components

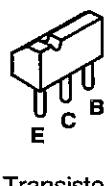
This unit uses CMOS LSI in the integral part of the circuits. When handling these parts, the following precautions should be strictly followed. CMOS LSI have extremely high impedance at its input and output terminals. For this reason, it is easily influenced by the surrounding high voltage power source, static electricity charge in clothes, etc., and sometimes it is not fully protected by the built-in protection circuit.

In order to protect CMOS LSI.

- 1) When storing and transporting, thoroughly wrap them in aluminium foil. Also wrap PW boards containing them in aluminium foil.
- 2) When soldering, ground the technician as shown in the figure and use grounded soldering iron and work table.



2. Shapes of Electronic Components



Transistor
2SB1238



Transistor
DTA123ES
KRA223M
KRC243M

3. Servicing of Touch Control Panel

We describe the procedures to permit servicing of the touch control panel of the microwave oven and the precautions you must take when doing so.

To perform the servicing, power to the touch control panel is available either from the power line of the oven itself or from an external power source.

(1) Servicing the touch control panel with power supply of the oven :

CAUTION:

THE HIGH VOLTAGE TRANSFORMER OF THE MICROWAVE OVEN IS STILL LIVE DURING SERVICING AND PRESENTS A HAZARD .

Therefore, when checking the performance of the touch control panel, put the outer cabinet on the oven to avoid touching the high voltage transformer, or unplug the primary terminal (connector) of the high voltage transformer to turn it off; the end of such connector must be insulated with an insulating tape. After servicing, be sure to replace the leads to their original locations.

A. On some models, the power supply cord between the touch control panel and the oven itself is so short that the two can't be separated.

For those models, check and repair all the controls (sensor-related ones included) of the touch control panel while keeping it connected to the oven.

B. On some models, the power supply cord between the touch control panel and the oven proper is so long enough that they may be separated from each other. For those models, therefore, it is possible to check and repair the controls of the touch control panel while keeping it apart from the oven proper; in this case you must short both ends of the door sensing switch (on PWB) of the touch control panel with a jumper, which brings about an operational state that is equivalent to the oven door being closed. As for the sensor-related controls of the touch control panel, checking them is possible if the dummy resistor(s) with resistance equal to that of the controls are used.

(2) Servicing the touch control panel with power supply from an external power source:

Disconnect the touch control panel completely from the oven proper, and short both ends of the door sensing switch (on PWB) of the touch control panel, which brings about an operational state that is equivalent to the oven door being closed. Connect an external power source to the power input terminal of the touch control panel, then it is possible to check and repair the controls of the touch control panel; it is also possible to check the sensor-related controls of the touch control panel by using the dummy resistor(s).

4. Servicing Tools

Tools required to service the touch control panel assembly.

- 1) Soldering iron: 30W
(It is recommended to use a soldering iron with a grounding terminal.)
- 2) Oscilloscope: Single beam, frequency range: DC - 10MHz type or more advanced model.
- 3) Others: Hand tools

5. Other Precautions

- 1) Before turning on the power source of the control unit, remove the aluminium foil applied for preventing static electricity.
- 2) Connect the connector of the key unit to the control unit being sure that the lead wires are not twisted.
- 3) After aluminium foil is removed, be careful that abnormal voltage due to static electricity etc. is not applied to the input or output terminals.
- 4) Attach connectors, electrolytic capacitors, etc. to PWB, making sure that all connections are tight.
- 5) Be sure to use specified components where high precision is required.

COMPONENT REPLACEMENT AND ADJUSTMENT

WARNING: Avoid possible exposure to microwave energy. Please follow the instructions below before operating the oven.

1. Disconnect oven from power supply.
2. Make sure that a definite "click" can be heard when the microwave oven door is unlatched. (Hold the door in a closed position with one hand, then push the door open button with the other, this causes the latch leads to rise, it is then possible to hear a "click" as the door switches operate.)
3. Visually check the door and cavity face plate for damage (dents, cracks, signs of arcing etc.).

Carry out any remedial work that is necessary before operating the oven.

Do not operate the oven if any of the following conditions exist;

Please refer to 'OVEN PARTS, CABINET PARTS, DOOR PARTS', when carrying out any of the following removal procedures:

OUTER CASE REMOVAL

To remove the outer case proceed as follows.

1. Disconnect oven from power supply.
2. Open the oven door and wedge it open.
3. Remove the screws from rear and along the side edge of case.
4. Slide the entire case back about 3cm to free it from retaining clips on the cavity face plate.
5. Lift the entire case from the oven.

1. Door does not close firmly.
2. Door hinge, support or latch hook is damaged.
3. The door gasket or seal or damaged.
4. The door is bent or warped.
5. There are defective parts in the door interlock system.
6. There are defective parts in the microwave generating and transmission assembly.
7. There is visible damage to the oven.

Do not operate the oven:

1. Without the RF gasket (Magnetron).
2. If the wave guide or oven cavity are not intact.
3. If the door is not closed.
4. If the outer case (cabinet) is not fitted.

6. Discharge the H.V. capacitor before carrying out any further work.
7. Do not operate the oven with the outer case removed.

N.B.; Step 1, 2 and 6 form the basis of the 3D checks.

CAUTION: DISCHARGE HIGH VOLTAGE CAPACITOR BEFORE TOUCHING ANY OVEN COMPONENT OR WIRING.

HIGH VOLTAGE COMPONENTS REMOVAL

(HIGH VOLTAGE CAPACITOR AND HIGH VOLTAGE RECTIFIER ASSEMBLY)

To remove the components, proceed as follows.

1. CARRY OUT 3D CHECKS.
2. Lift up the cover of the fan duct B.
3. Disconnect all the leads and terminals of high voltage rectifier assembly from the high voltage capacitor.
4. Remove one (1) screw holding capacitor holder and high voltage rectifier assembly to the base plate.
5. Release the capacitor holder from the base plate.
6. Now, the high voltage rectifier assembly should be free.

7. Remove the capacitor from the capacitor holder.
8. Now the capacitor should be free.

CAUTION: WHEN REPLACING HIGH VOLTAGE RECTIFIER ASSEMBLY, ENSURE THAT THE CATHODE (EARTH) CONNECTION IS SECURELY FIXED TO THE CAPACITOR HOLDER AND BASE PLATE WITH AN EARTHING SCREW.

HIGH VOLTAGE TRANSFORMER REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the filament leads of high voltage transformer from high voltage capacitor and the magnetron.
3. Disconnect the H.V. wire A from the high voltage transformer.

4. Disconnect the main wire harness from the high voltage transformer.
5. Remove the four (4) screws holding the transformer to base plate.
6. Remove the transformer.
7. Now the high voltage transformer is free.

OVEN LAMP SOCKET REMOVAL

1. CARRY OUT 3D CHECKS
2. Disconnect the wire leads from the oven lamp.

3. Lift up the oven lamp by releasing the two (2) tabs of the air intake duct.
4. Now, the oven lamp socket is free.

COMPONENT REPLACEMENT AND ADJUSTMENT

MAGNETRON REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the two (2) screw holding the chassis support to the oven cavity and the magnetron.
3. Disconnect the H.V. wire B and filament lead of the transformer from the magnetron.
4. Release the chassis support from the oven cavity.
5. Move the air intake duct to left.
6. Remove the air deflector A from the magnetron.

7. Carefully remove two (2) screws holding magnetron to waveguide, when removing the screws hold the magnetron to prevent it from falling.
8. Remove the magnetron from the waveguide with care so the magnetron antenna is not hit by any metal object around the antenna.
9. Remove the magnetron cushion from the magnetron.

CAUTION: WHEN REPLACING THE MAGNETRON, BE SURE THE R.F. GASKET IS IN PLACE AND THE MAGNETRON MOUNTING SCREWS ARE TIGHTENED SECURELY.

FAN MOTOR REPLACEMENT

REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the one (1) screw holding the noise filter to the chassis support.
3. Release the noise filter from the tabs of the fan duct.
4. Disconnect the wire leads from the fan motor.
5. Remove the one (1) screw holding the fan duct to the oven cavity back plate.
6. Remove the fan duct from the oven.
7. Remove the fan blade from the fan motor shaft according to the following procedure.

- 1) Hold the edge of the rotor of the fan motor by using a pair of groove joint pliers.

CAUTION:

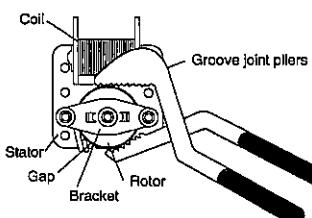
- Make sure that any pieces do not enter the gap between the rotor and the starter of the fan motor. Because the rotor is easy to be shaven by pliers and metal pieces may be produced.
- Do not let the pliers touch the coil of the fan motor because the coil may be cut or damaged.
- Do not distort the bracket by touching with the pliers.

- 2) Remove the fan blade from the shaft of the fan motor by pulling and rotating the fan blade with your hand.
- 3) Now, the fan blade will be free.

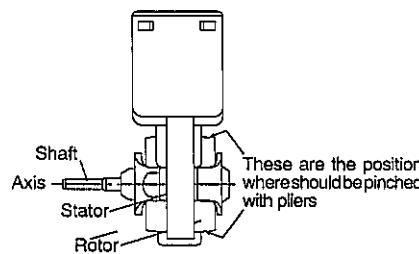
CAUTION:

- Do not use this removed fan blade again. Because the hole (for shaft) of it may become bigger than a standard one.

8. Now, the fan motor is free.



Rear view



Side view

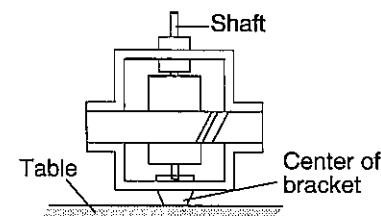


Figure C-1 Fan motor replacement

COMPONENT REPLACEMENT AND ADJUSTMENT

TURNTABLE MOTOR REPLACEMENT

Removal

1. Disconnect the oven from the power supply.
2. Remove the turntable and roller stay from the oven cavity.
3. Turn the oven over.
4. Cut the four (4) bridges holding the turntable motor cover to the base plate with the cutting pliers as shown in Figure C-4 (a).

CAUTION: DO NOT DROP THE TURNTABLE MOTOR COVER INTO THE OVEN AFTER CUTTING THE BRIDGES. BECAUSE IT WILL DAMAGE THE WIRE LEADS OF THE MOTOR AND IT IS DIFFICULT TO REMOVE IT OUT OF THE OVEN.

5. Remove the turntable motor cover from the base plate.
6. Disconnect the wire leads from the turntable motor.
7. Remove the two (2) screws holding the turntable motor to the oven cavity.
8. Remove the turntable motor from the oven cavity.
9. Now, the turntable motor is free.

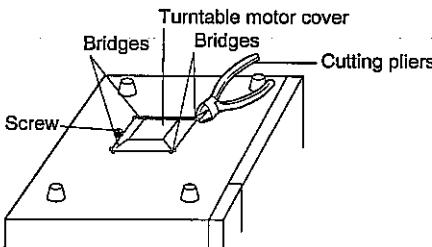


Figure C-4(a). Turntable Motor Cover Removal

Re-install

1. Remove the any sharp edges on the turntable motor cover and the base plate with the cutting pliers.
2. Remove the single (1) screw on the base plate as shown in Figure C-4 (a).
3. Re-install the turntable motor to the oven cavity with the two (2) screws.
4. Re-connect the wire leads to the turntable motor.
5. Insert the tab of the turntable motor cover into the hole of the base plate as shown in Figure C-4(b).
6. Re-install the turntable motor cover to the base plate with the screw which are removed at the above step 2 as shown in Figure C-4(b).

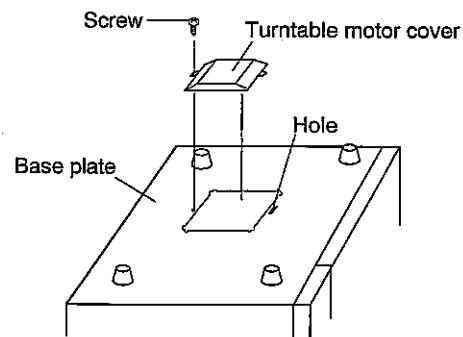


Figure C-4(b). Turntable Motor Cover Re-install

POSITIVE LOCK® CONNECTOR REMOVAL

1. CARRY OUT 3D CHECKS.
2. Push the lever of positive lock® connector.
3. Pull out the positive lock® connector.

CAUTION: WHEN YOU (SERVICE ENGINEERS) CONNECT THE POSITIVE LOCK® CONNECTORS TO THE TERMINALS, CONNECT THE POSITIVE LOCK® SO THAT THE LEVER FACE YOU (SERVICE ENGINEERS).

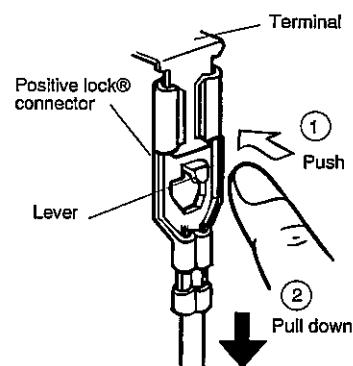


Figure C-2 Positive lock® connector

COMPONENT REPLACEMENT AND ADJUSTMENT

POWER CORD REMOVAL

Removal

1. CARRY OUT 3D CHECKS.
2. Remove the single (1) screw holding the green/yellow wire to the cavity.
3. Disconnect the leads of the power supply cord from the noise filter, referring to the Figure C-3 (a).
4. Release the power supply cord from the rear cabinet.
5. Now, the power supply cord is free.

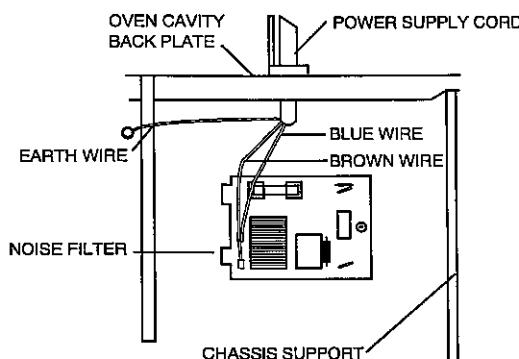


Figure C-3 (a) Replacement of Power Supply Cord

Re-install

1. Insert the moulding cord stopper of power supply cord into the square hole of the rear cabinet, referring to the Figure C-3 (b). Installation of Power supply cord.
2. Install the earth wire lead of power supply cord to the oven cavity with one (1) screw and tighten the screw.
3. Connect the brown and blue wire leads of power supply cord to the noise filter correctly, referring to the Pictorial Diagram.

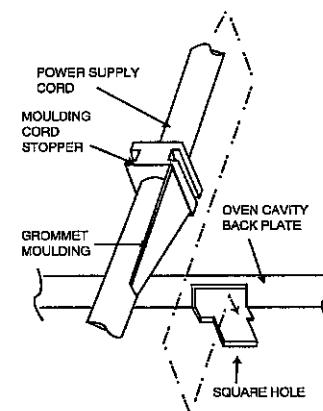


Figure C-3 (b) Replacement of Power Supply Cord

CONTROL PANEL ASSEMBLY REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the all leads and connectors from the control unit.
3. Remove the one (1) screw holding the control panel to the oven cavity and remove the control panel.
4. Lift up the control panel assembly and pull it forward.
5. Now the control panel assembly is free.

GRILL HEATING ELEMENT REMOVAL

1. CARRY OUT 3D CHECKS
2. Disconnect the wire leads to the grill heating elements.
3. Remove the one (1) screw holding the exhaust duct to the oven cavity.
4. Push the two tabs holding the reflector to the oven cavity.
5. Release the reflector from the oven cavity by sliding it.
6. Now the grill heating element assembly is free.
7. Remove the grill heater angle from the reflector.
8. Remove the two (2) screws holding the short-plate to the grill heating elements.
9. Now the individual grill heating elements are free.

LATCH SWITCH, MONITOR SWITCH AND STOP SWITCH REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the control panel assembly referring to "CONTROL PANEL REPLACEMENT".
3. Remove the open lever from the oven cavity front plate by removing the control panel assy.
4. Disconnect the leads from all switches.
5. Remove the one (1) screw holding the latch hook to the oven cavity.
6. Remove the latch hook.
7. Remove the switch(s) from the latch hook by pushing the retaining tab backwards slightly and turning the switch(s) on the post.
8. Now, the switch(s) is free.

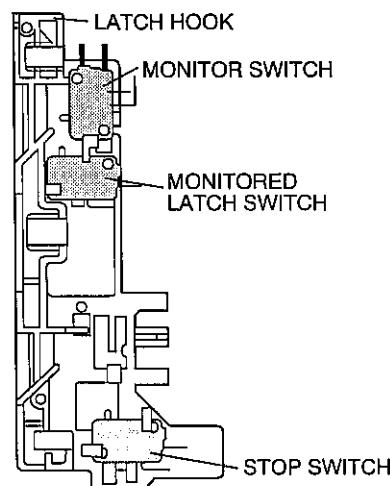


Figure C-5 Switches

COMPONENT REPLACEMENT AND ADJUSTMENT

DOOR REPLACEMENT AND ADJUSTMENT

DOOR REPLACEMENT

1. CARRY OUT 3D CHECKS
2. Remove non return washer from bottom of door hinge.
3. Remove choke cover taking care not to break clips.
4. Remove door assembly by lifting and easing it forward.
5. Make sure the door is parallel with bottom line of the oven face plate and the latch head pass through the latch holes correctly.

6. CARRY OUT 4R CHECKS

NOTE: After any service to the door, the approved microwave survey meter should be used to assure in compliance with proper microwave radiation standards. (Refer to Microwave Measurement Procedure).

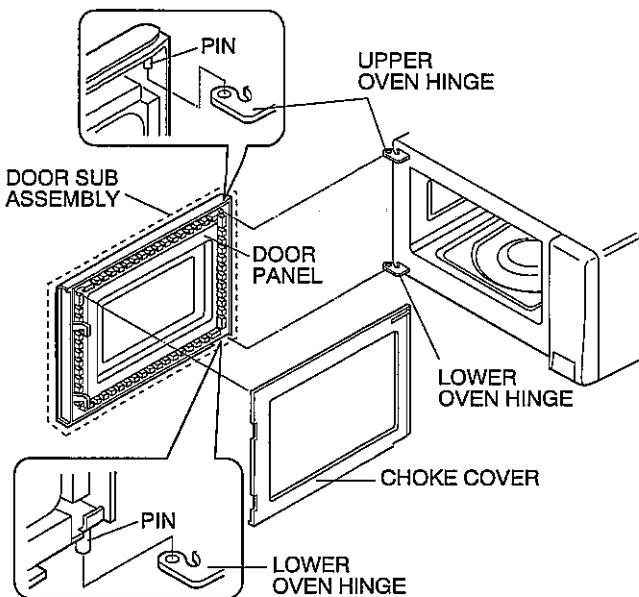


Figure C-5. Door Assembly Replacement and Adjustment

CHOKE COVER REMOVAL

1. Insert an iron plate (thickness of about 0.5mm) or flat type screw driver to the gap between the choke cover and door panel as shown figure to free the engaged part. The protect sheet may be used not to damage the door panel.
2. Lift up the choke cover, now choke cover is free.

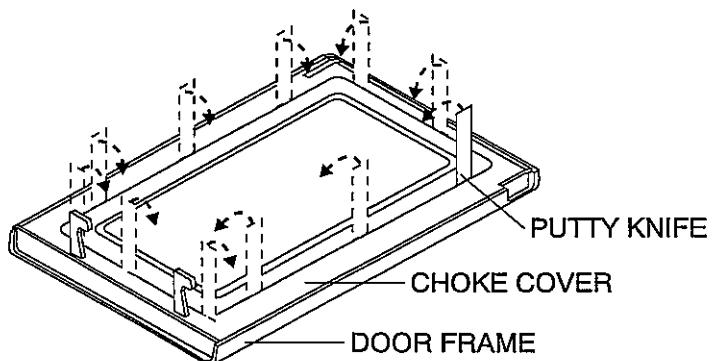


Figure C-6. Choke Cover Removal

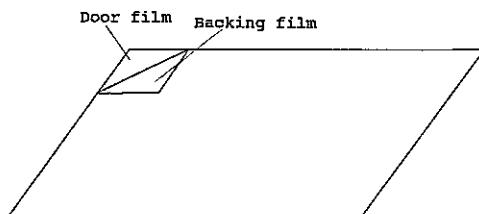


Figure C-7. Door Film

INNER DOOR FILM

Removal

1. Tear the door film from the door panel.
2. Now, the door film is free.

Installation

1. Tear away the backing film.
2. Put the pasted side of the door film on the door panel.

OUTER DOOR FILM

Removal

1. Remove the door film from the clips on the door frame.

Installation

1. Attach the door film to the clips on the door frame.

MICROWAVE MEASUREMENT

After any repair, the microwave oven must be checked for microwave leakage to ensure continued safe operation. BS EN 60335-2-25 specifies that the maximum permitted leakage with a load of 275 ml is 50 W/m² (equivalent to 5 mW/cm²) at a distance of 5 cm from the oven.

PREPARATION

The following items are required to carry out this test:-

1. A low form of 600 ml beaker made from an electrically non-conductive material, such as glass or plastic, with an inside diameter of approximately 8.5 cm. This must contain 275 ± 15 ml of water, at an initial temperature of $20 \pm 2^\circ\text{C}$.
2. A leakage detector which has been calibrated within the preceding 12 months to a stand whose accuracy can be traced to National Physical Laboratory Standards.

Recommended instruments are:

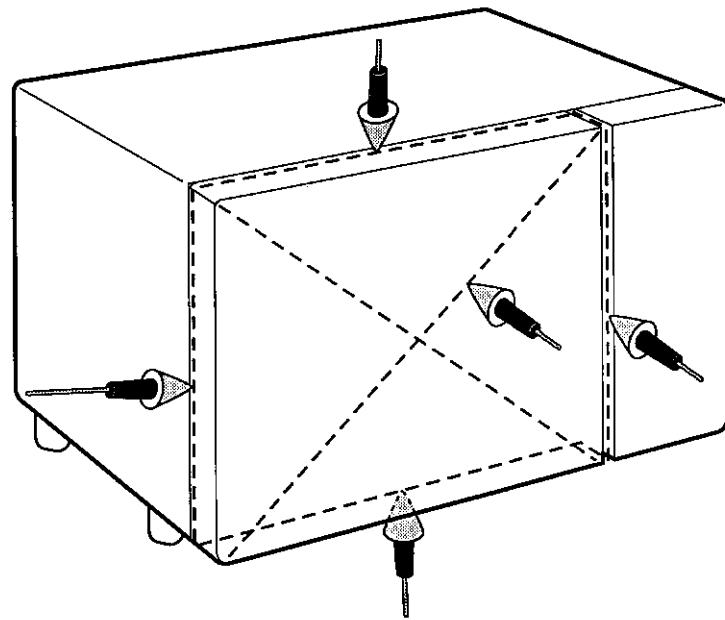
Apollo "XI"

Celtec "A100"

PROCEDURE

1. Place the beaker containing the water load in the oven cavity at the centre of the turntable. The placing of this standard load in the oven is important, not only to protect the oven, but also to ensure that any leakage it is not disguised by too large a load absorbing energy.
2. Close the oven door, and with the power level set to FULL, turn the oven ON with the timer set for a few minutes operation. Should the water begin to boil before the test has been completed, it should be replaced.
3. As shown in the diagram below, move the probe slowly (not faster than 2.5 cm/sec.);
 - a) around the edge of the door following the gap
 - b) across the face of the door
 - c) across any vents in the oven's sides, rear or top

Dotted line indicates the path taken by the leakage detector.



Whilst the maximum leakage permitted in BS EN 60335-2-25 is 50 W/m² (equivalent to 5 mW/cm²), it is not normal to detect any significant leakage, and therefore any detected leakage should be investigated.

TEST DATA AT A GLANCE

Parts	Symbol	Value / Data
Fuse	F1	F8A
Fuse	F2	15A
Thermal cut-out (MG.)	TC1	150°C
Thermal cut-out (OVEN)	TC2	150°C
Grill heating element	GH	Approx. $27.9 \Omega \times 2 = 55.8\Omega$, 1.0 kW (500W x 2) Insulation resistance > 10 MΩ
Oven lamp	OL	240–250 V 25W
High voltage capacitor	C	AC 2000V 0.97μF
Magnetron	MG	Filament < 1Ω Filament – chassis ∞ ohm.
Power transformer	T	Filament winding < 1Ω Secondary winding Approx. 120 Ω / Primary winding Approx. 2 Ω

TEST POINTS ON CONTROL UNIT

In/Out put terminal	Test Point	Volt	Resistance (Disconnect the powerand door is closed)
Input terminal (Power supply)	A1 - A3	230 V	Approx. 1.04 kΩ
Input terminal (Stop switch)	B1 - B2	-	0
Output terminal (Grill heating element)	COM. of RY3 - A3	230 V	Approx. 370 Ω
Output terminal (Oven lamp, fan motor and turntable motor)	A3 - A5	230 V	Approx. 180 Ω
Output terminal (Earth)	B2 - Chassis	-	0
Output terminal (High voltage transformer)	COM. of RY2 - A3	230V	Approx. 370 Ω

WARNING: DISCONNECT THE PLUG WHEN MEASURING RESISTANCE.

WIRING / RE-WIRING

WARNING: Before carrying out any work carry out 3D checks

- 1) Disconnect the supply.
- 2) Door opened, and wedged open.
- 3) Discharge high voltage capacitor.

RE-WIRING

Ensure the following:

1. Wires must not touch:
 - a) High voltage parts.
(Magnetron, high voltage transformer, high voltage capacitor and high voltage rectifier assembly)
 - b) Parts that become hot.
(Heating elements, oven lamp, oven cavity magnetron and high voltage transformer)
 - c) Sharp edges.
(Bottom plates, oven cavity, waveguide flange, chassis support and other metallic parts)
 - d) Movable parts.
(Fan blade, any motor, switch, switch lever and open button)
2. Positive lock connectors are fitted correctly. Ensure the locking pin is located correctly.
3. Wires are connected correctly as per pictorial diagram.
4. No wire leads are trapped by the outer wrap.

WIRING DIAGRAMS

SCHEMATIC

NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. PLUG CONNECTED.

Note:
AC CORD CONNECTION
BRN : BROWN
BLU : BLUE
G-Y : GREEN AND YELLOW STRIPE
/17 : SECTIONAL AREA OF 1.0mm²MIN.
★ Indicates components with potential above 250 V.

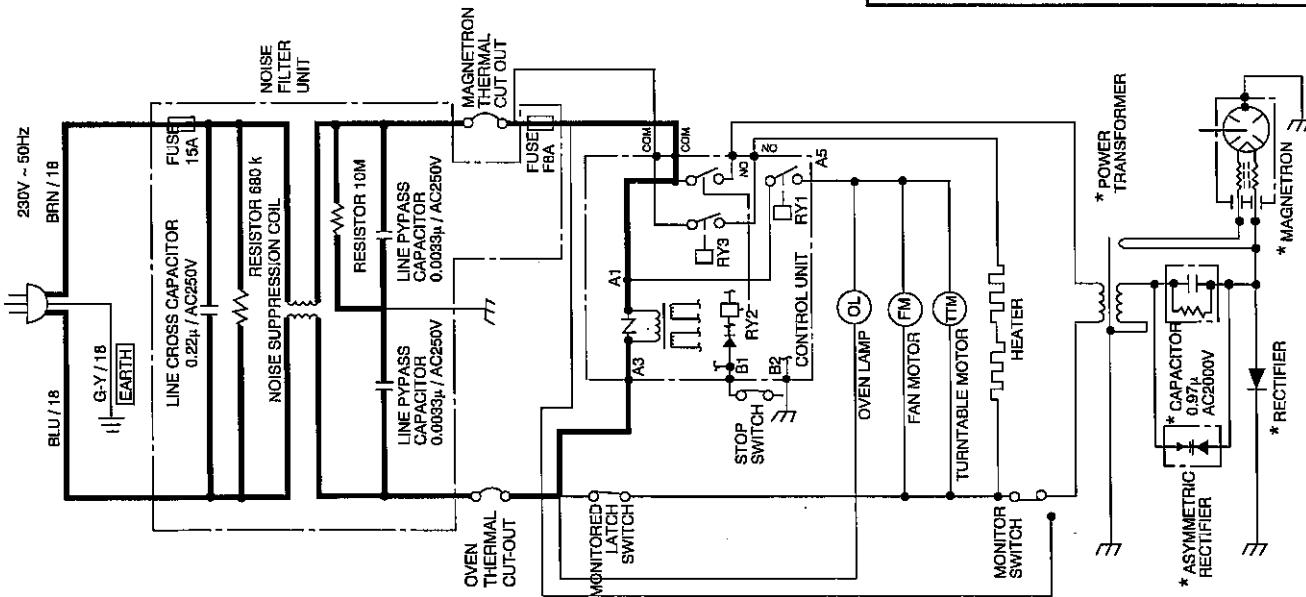


Figure O-1 Oven Schematic-OFF Condition

SCHEMATIC

NOTE: CONDITION OF OVEN
1. DOOR CLOSE.
2. COOKING TIME PROGRAMMED.
3. MICROWAVE PAD TOUCHED ONCE.
4. START KEY TOUCHED.

Note:
AC CORD CONNECTION
BRN : BROWN
BLU : BLUE
G-Y : GREEN AND YELLOW STRIPE
/17 : SECTIONAL AREA OF 1.0mm²MIN.
★ Indicates components with potential above 250 V.

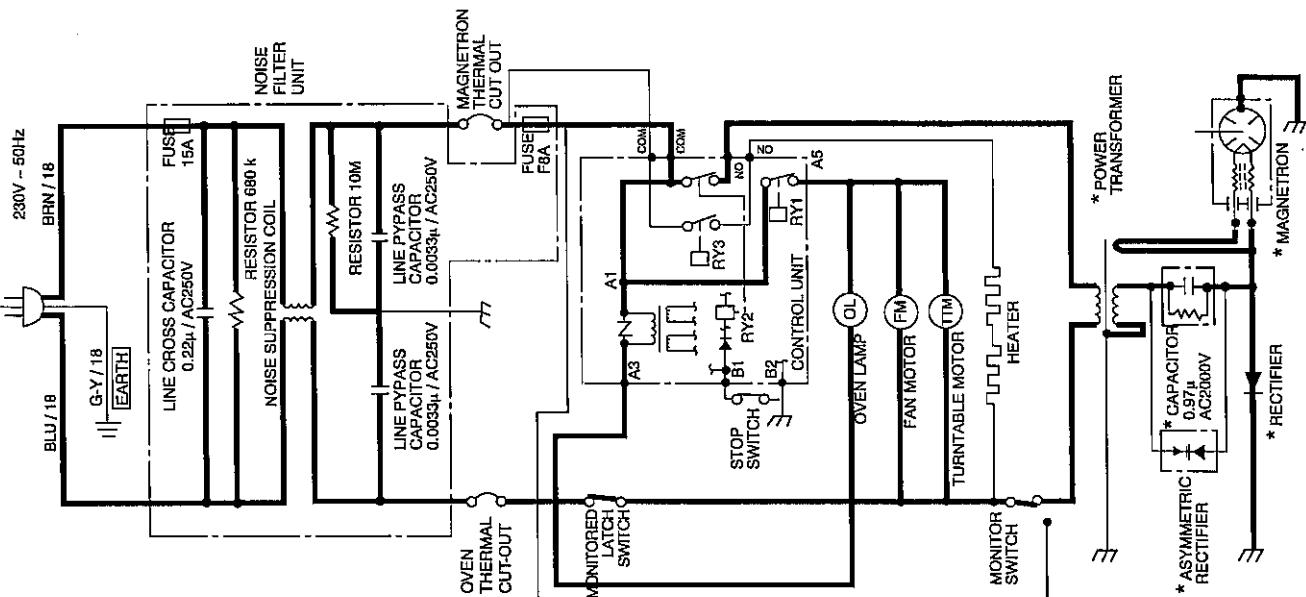


Figure O-2 Oven Schematic-Microwave Cooking Condition

WIRING DIAGRAMS

SCHEMATIC

NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME PROGRAMMED.
3. GRILL KEY TOUCHED.
3. START KEY TOUCHED.

Note:
AC CORD CONNECTION
BRN : BROWN
BLU : BLUE

G-Y : GREEN AND YELLOW STRIPE
/17 : SECTIONAL AREA OF 1.0mm²MIN.

★ Indicates components with potential above 250 V.

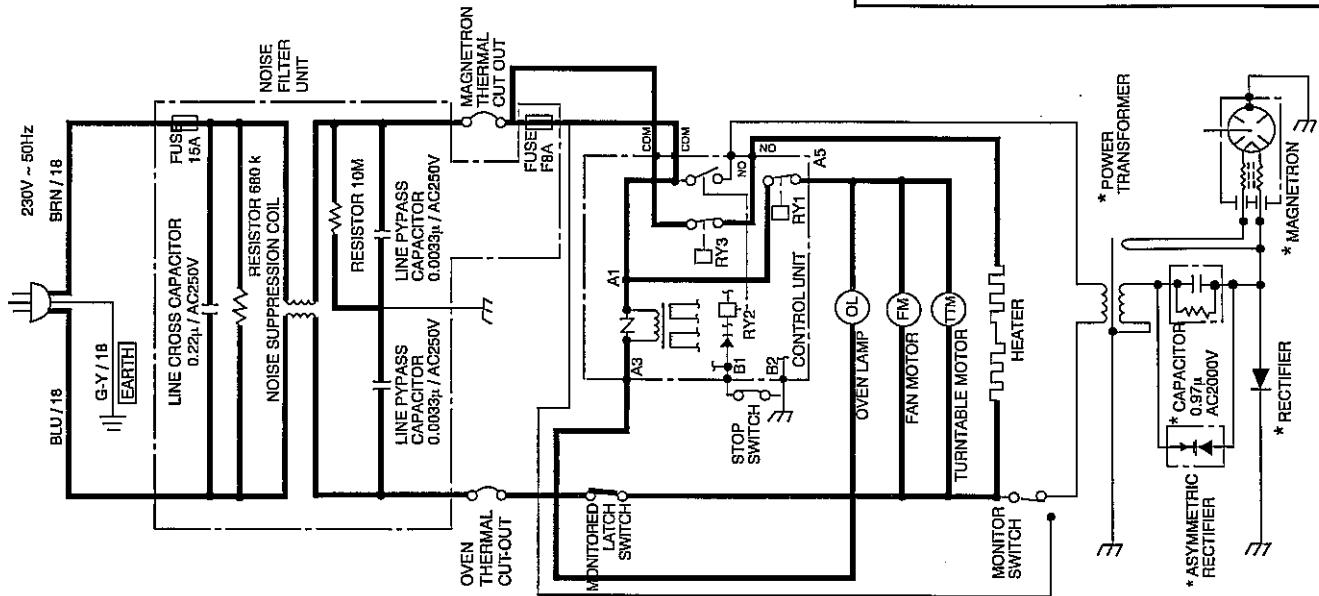


Figure O-3 Oven Schematic-Grill Cooking Condition

SCHEMATIC

NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME PROGRAMMED.
3. COMBI GRILL KEY TOUCHED.
3. START KEY TOUCHED.

Note:
AC CORD CONNECTION
BRN : BROWN
BLU : BLUE

G-Y : GREEN AND YELLOW STRIPE
/17 : SECTIONAL AREA OF 1.0mm²MIN.

★ Indicates components with potential above 250 V.

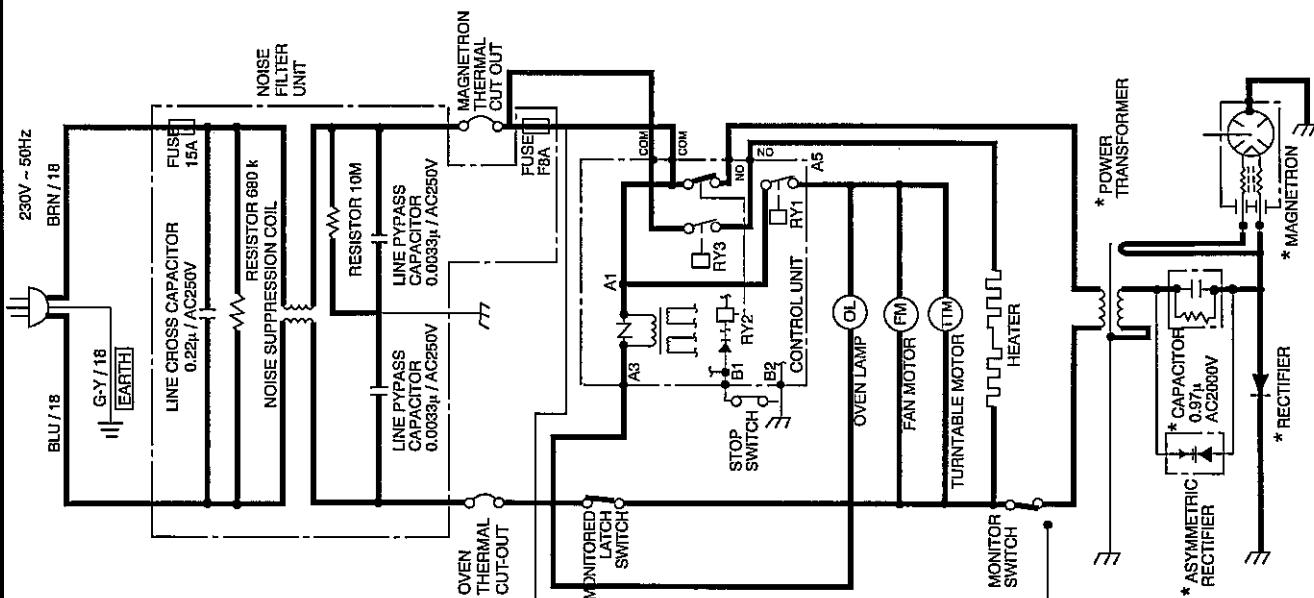


Figure O-4 Oven Schematic-Dual Cooking Condition

WIRING DIAGRAMS

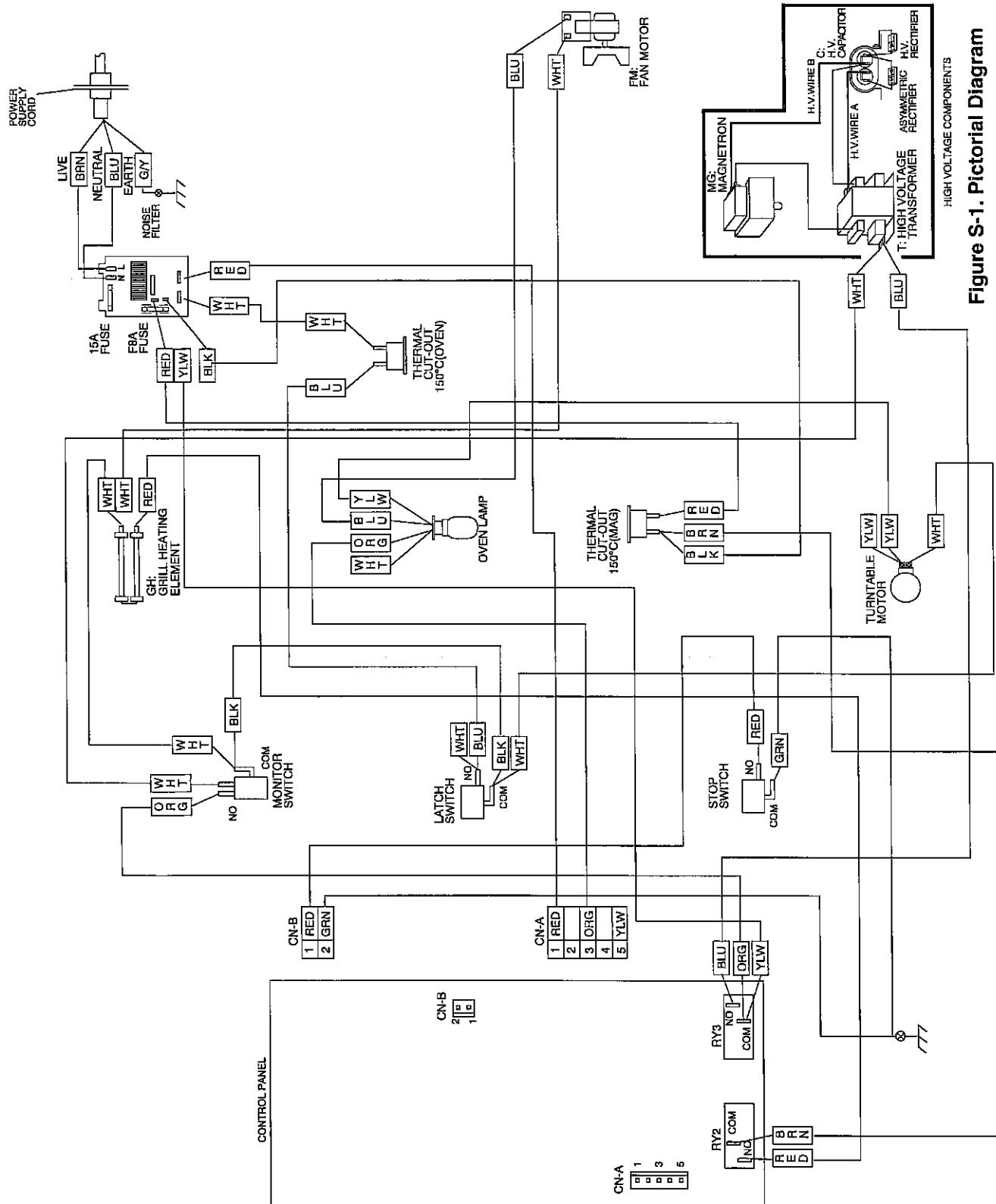


Figure S.1. Pictorial Diagram

WIRING DIAGRAMS

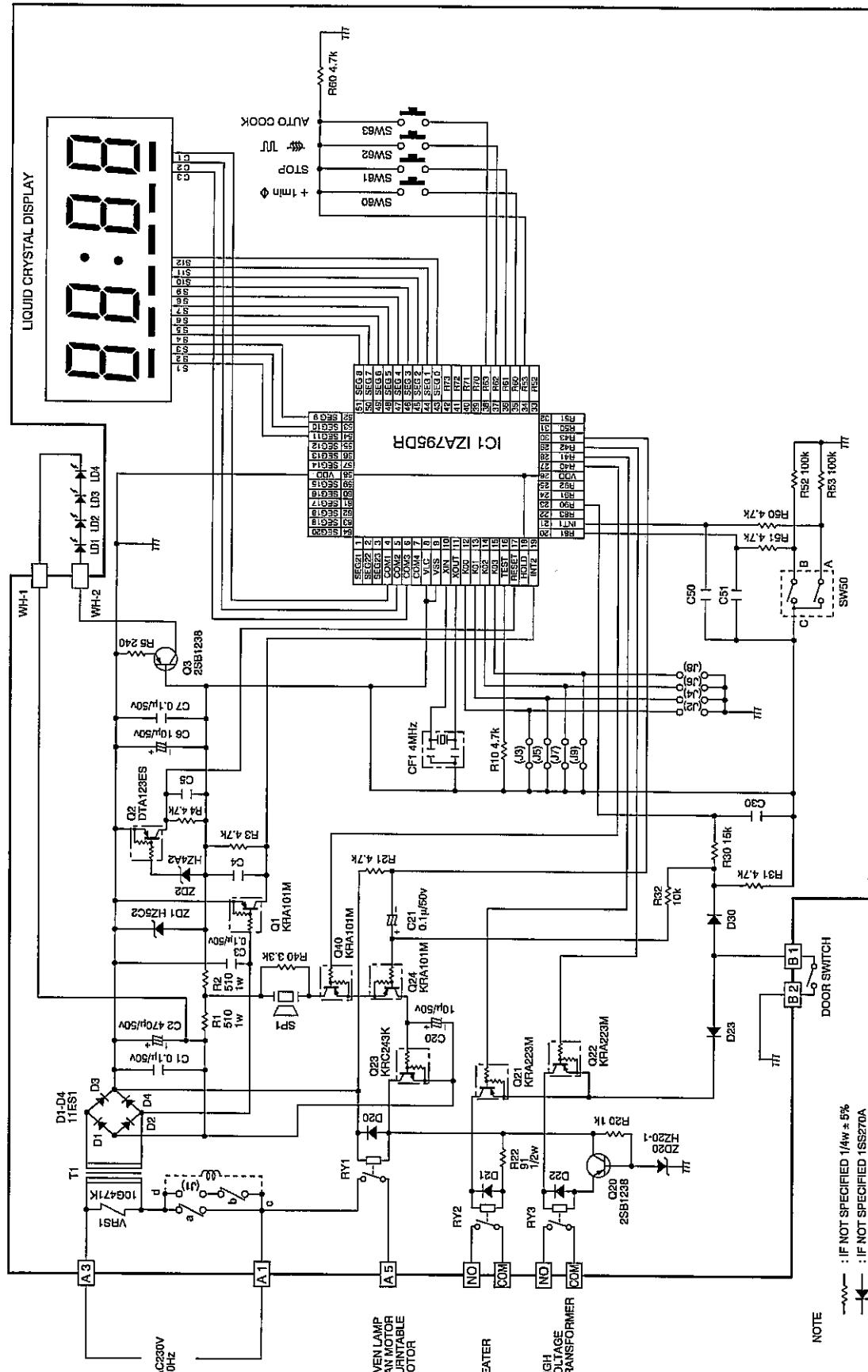


Figure S-2. Control Panel Circuit

WIRING DIAGRAMS

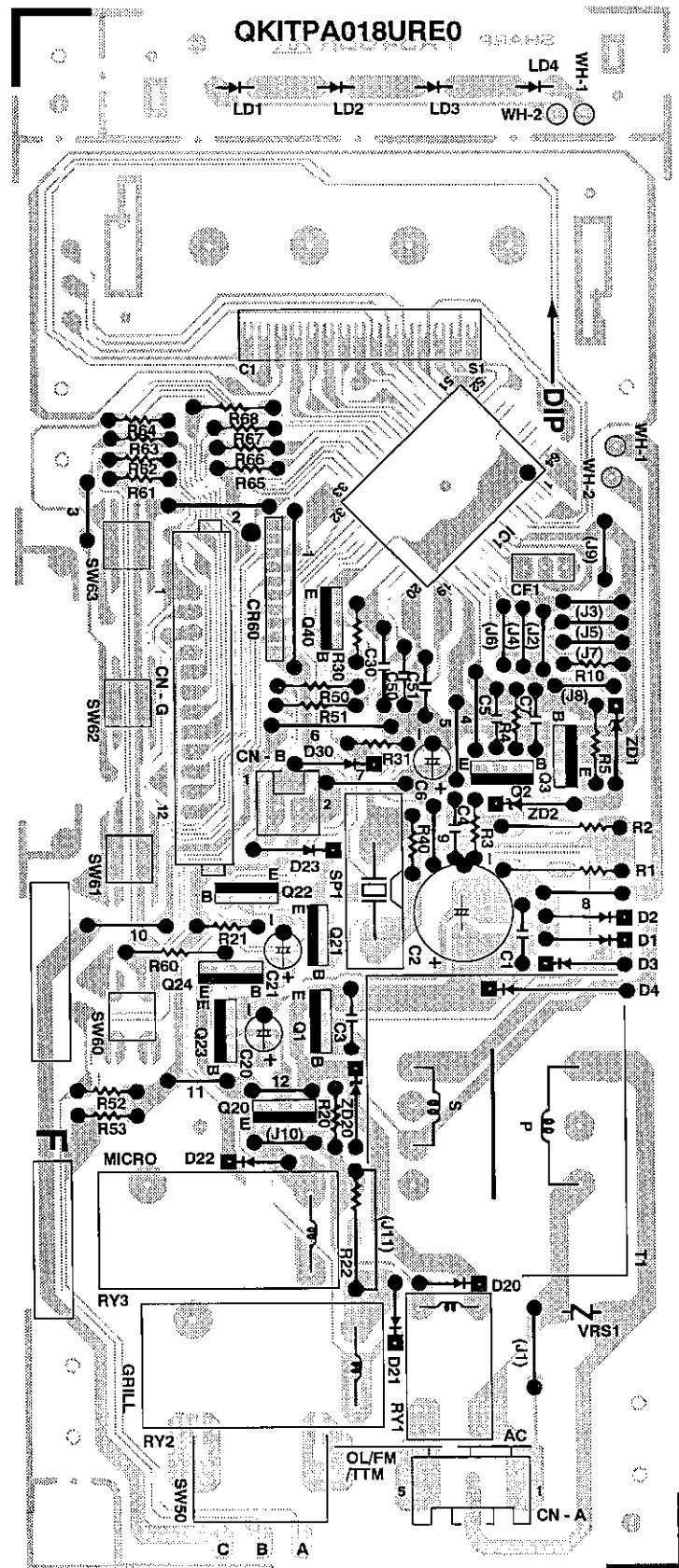


Figure S-3. Printed Wiring Board

PARTS LIST

Note: The parts marked ** are used in voltage more than 250V. The parts marked Δ may cause undue microwave exposure
" \$" MARK: SPARE PARTS-DELIVERY SECTION

ELECTRIC PARTS

REF. NO.	PART NO.	\$	DESCRIPTION	Q'TY	CODE
1-1	FH-DZA035WRE0	U	H.V. rectifier assembly	1	AP
1-2	RC-QZA183WRE0	U	High voltage capacitor	1	AX
1-3	QSW-MA112WRE0	J	Monitor switch	1	AN
1-4	QSW-MA110WRE0	J	Monitored latch switch	1	AK
1-5	QSW-MA110WRE0	J	Stop switch	1	AK
1-6	FPWBFA309WRE1	U	Noise filter	1	AT
1-7	QFS-CA024WRE0	U	Fuse F8A	1	AC
1-8	QFS-B0019MRE0	U	Fuse 15A	1	AC
1-9			Not applicable to this model		
1-10			Not applicable to this model		
1-11	RTHM-A099WRE0	U	Thermal cut-out 150°C (Oven)	1	AH
1-12	RTHM-A099WRE0	U	Thermal cut-out 150°C (Magnetron)	1	AH
1-13	QACCVAA004URE1	U	Power supply cord	1	AQ
1-14	RMOTEA339WRE1	U	Fan motor	1	AU
1-15	RV-MZA270WRE0	U	Magnetron	1	BG
1-16	RLMPATA066WRE0	U	Oven lamp/Socket	1	AK
1-17	FMOTDA056WRK0	J	Turntable motor assy	1	AR
* 1-18	RTRN-A004URE0	U	Power transformer	1	BL

CABINET PARTS

REF. NO.	PART NO.	\$	DESCRIPTION	Q'TY	CODE
Δ 2-1	GCABUA010URP0	U	Outer case cabinet (B)	1	AW
Δ 2-1	GCABUA471WRT0	U	Outer case cabinet (W)	1	AW
Δ 2-1	GCABUA013WRT0	U	Outer case cabinet (IN)	1	AW
2-2	GLEGPA057WRE0	U	Foot	2	AB

CONTROL PANEL PARTS

REF. NO.	PART NO.	\$	DESCRIPTION	Q'TY	CODE
3- 1	DPWBFA021URU0	U	Control unit	1	BM
3- 1A	QCNCMA430DRE0	U	3-pin connector (CN-A)	1	AC
3- 1B	QCNCMA414DRE0	U	2-pin connector (CN-B)	1	AB
3- 1C	QW-QZA003URE2	U	Lead wire (WH-1, WH-2)	2	AA
3- 1D	RLCDSA036DRE0	U	Liquid crystal display	1	AL
3- 1E	LHLD-A002URF1	U	LCD holder	1	AC
3- 1F	PSHEPA569WRE0	U	LED sheet	1	AD
3- 1G	PSHEPA012URE0	U	Protective sheet	1	AB
C1	RC-KZA087DRE0	U	Capacitor 0.1 uF 50V	1	AB
C2	RC-EZA323DRE0	U	Capacitor 470 uF 50V	1	AA
C3	RC-KZA087DRE0	U	Capacitor 0.1 uF 50V	1	AB
C4-5	VCKYD41CY103N	U	Capacitor 0.01 uF 16V	2	AA
C6	RC-EZA322DRE0	U	Capacitor 10 uF 50V	1	AB
C7	RC-KZA087DRE0	U	Capacitor 0.1 uF 50V	1	AB
C20	RC-EZA322DRE0	U	Capacitor 10 uF 50V	1	AB
C21	RC-EZA302DRE0	U	Capacitor 0.1 uF 50V	1	AB
C30	VCKYD41CY103N	U	Capacitor 0.01 uF 16V	1	AA
C50-51	VCKYD41CY103N	U	Capacitor 0.01 uF 16V	2	AA
CF1	RCRS-A012DRE0	U	Ceramic resonator	1	AD
D1-4	VHD11ES1///-1	U	Diode (11ES1)	4	AB
D20-23	VHD1SS270A/-1	U	Diode (1SS270ATA)	4	AA
D30	VHD1SS270A/-1	U	Diode (1SS270ATA)	1	AA
IC1	RH-IZA795DRE0	J	LSI	1	AP
LD1-4	VHPSLZ781C9-3	U	Light emitting diode	4	AC
Q1	VSKRA101M///-3	U	Transistor (KRA101M)	1	AA
Q2	VSDTA123ES/-3	U	Transistor (DTA123ES)	1	AB
Q3	VS2SB1238///-3	U	Transistor (2SB1238)	1	AD
Q20	VS2SB1238///-3	U	Transistor (2SB1238)	1	AD
Q21-22	VSKRA223M///-3	U	Transistor (KRA223M)	2	AB
Q23	VSKRC243M///-3	U	Transistor (KRC243M)	1	AB

PARTS LIST

Note: The parts marked "*" are used in voltage more than 250V. The parts marked Δ may cause undue microwave exposure
"S" MARK: SPARE PARTS-DELIVERY SECTION

CONTROL PANEL PARTS (CONTINUED)

REF. NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE
Q24	VSKRA101M//--3	U	Transistor (KRA101M)	1	AA
Q40	VSKRA101M//--3	U	Transistor (KRA101M)	1	AA
R1-2	VRS-B13AA511J	U	Resistor 510 ohm 1W	2	AB
R3-4	VRD-B12EF472J	U	Resistor 4.7k ohm 1/4W	2	AA
R5	VRD-B12EF241J	U	Resistor 240 ohm 1/4W	1	AA
R10	VRD-B12EF472J	U	Resistor 4.7k ohm 1/4W	1	AA
R20	VRD-B12EF102J	U	Resistor 1.0k ohm 1/4W	1	AA
R21	VRD-B12EF472J	U	Resistor 4.7k ohm 1/4W	1	AA
R22	VRD-RM2HD910J	U	Resistor 91 ohm 1/2W	1	AH
R30	VRD-B12EF153J	U	Resistor 15k ohm 1/4W	1	AA
R31	VRD-B12EF472J	U	Resistor 4.7k ohm 1/4W	1	AA
R32	VRD-B12EF103J	U	Resistor 10k ohm 1/4W	1	AA
R40	VRD-B12EF332J	U	Resistor 3.3k ohm 1/4W	1	AA
R50-51	VRD-B12EF472J	U	Resistor 4.7k ohm 1/4W	2	AA
R52-53	VRD-B12EF104J	U	Resistor 100k ohm 1/4W	2	AA
R60	VRD-B12EF472J	U	Resistor 4.7k ohm 1/4W	1	AA
RY1	RRLY-A080DRE0	U	Relay (OJ-SH-124LM)	1	AG
RY2	RRLY-A093DRE0	U	Relay (VRB18)	1	AM
RY3	RRLY-A092DRE0	U	Relay (VRB18SP)	1	AP
SP1	RALM-A014DRE0	U	Buzzer (PKM22EPT-THAI)	1	AG
SW50	RVR-BA018WRE0	U	Encoder	1	AH
SW60-63	QSW-PA004DRE0	U	Tact switch	4	AU
T1	RTRNPA112DRE0	U	Transformer	1	AP
VRS1	RH-VZA034DRE0	U	Varistor (10G471K)	1	AD
ZD1	VHEHZ5C2//--1	U	Zener diode (HZ5C2)	1	AB
ZD2	VHEHZ4A2//--1	U	Zener diode (HZ4A2)	1	AB
ZD20	VHEHZ201//--1	U	Zener diode (HZ20-1)	1	AB
3- 2	GMADIA005URF0	U	Display window	1	AE
3- 3	HPNLCA047URR0	U	Control panel frame [R-630A(B)]	1	AM
3- 3	HPNLCA048URR0	U	Control panel frame [R-630A(W)]	1	AM
3- 3	HPNLCA105URR0	U	Control panel frame [R-630A(IN)]	1	AM
3- 4	JBTN-A024URF0	U	Key button [R-630A(W)]	1	AD
3- 4	JBTN-A025URF0	U	Key button [R-630A(B)]	1	AD
3- 4	JBTN-A089URF0	U	Key button [R-630A(IN)]	1	AD
3- 5	JBTN-A029URF0	U	Start button [R-630A(W)]	1	AE
3- 5	JBTN-A077URF0	U	Start button [R-630A(B)]	1	AD
3- 5	JBTN-A087URF0	U	Start button [R-630A(IN)]	1	AB
3- 6	JKNBKA018URF0	U	Rotary knob [R-630A(W)]	1	AD
3- 6	JKNBKA019URF0	U	Rotary knob [R-630A(B)]	1	AD
3- 6	JKNBKA033URF0	U	Rotary knob [R-630A(IN)]	1	AC
3- 7	JBTN-A001URF0	U	Open button [R-630A(B)]	1	AE
3- 7	JBTN-B009WRF0	U	Open button [R-630A(W)]	1	AE
3- 7	JBTN-A003WRF0	U	Open button [R-630A(IN)]	1	AE
3- 8	LSTPPA005URF0	U	Stopper	1	AC
3- 9	MSPRCA045WRE0	U	Open button spring	1	AA
3- 10	XEPSD30P10XS0	U	Screw; 3mm x 10mm	5	AA

OVEN PARTS

REF NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE
4-1	DOVN-A006URK0	U	Oven cavity	1	BE
4-2	GDAI-A280WRP1	U	Base plate	1	AQ
4-3	LBNDKA111WRP0	U	Capacitor holder	1	AD
4-4	PHOK-A092WRF4	U	Latch hook	1	AH
4-5	MLEVFA078WRF0	U	Open lever	1	AE
4-6	PDUC-A638WRF2	U	Fan duct	1	AE
4-7	NFANJA029WRE0	U	Fan blade	1	AM
4-8	LANGFA169WRP5	U	Chassis support	1	AE
4-9	PPACGA126WRE0	U	Packing	1	AC
4-10	PCOVFA309WRE0	U	Waveguide cover	1	AC
4-11	PDUC-A581WRF2	U	Air intake duct	1	AE
4-12	PLUDGA001URP0	U	HVT cushion	1	AA
4-13	PSPAGA001WRE0	U	Vibration Proof Cushion	1	AA
4-14	PCUSUA340WRP2	U	Air Deflection Cushion	1	AA

PARTS LIST

Note: The parts marked ** are used in voltage more than 250V. The parts marked Δ may cause undue microwave exposure
"S" MARK: SPARE PARTS-DELIVERY SECTION

DOOR PARTS

REF NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE
Δ 5	CDORFA051URK0	U	Door assembly (B)	1	BB
Δ 5	CDORFA050URK0	U	Door assembly (W)	1	BB
Δ 5	CDORFA083URK0	U	Door assembly (IN)	1	BB
5-1	FDORFA299WR0	U	Door panel assembly	1	AU
Δ 5-2	GCOVHA366WR0	U	Choke cover	1	AG
5-3	GWAKPA047URR0	U	Door frame (B)	1	AQ
5-3	GWAKPA046URR0	U	Door frame (W)	1	AQ
5-3	GWAKPA097URR0	U	Door frame (IN)	1	AQ
5-4	PSHEPA560WRE0	U	Outer sealer film	1	AE
5-5	LSTPPA158WR0	U	Latch head	1	AD
5-6	MSPRTA141WRE0	U	Latch spring	1	AA
5-7	PSHEPA482WRE0	U	Inner Sealer film	1	AH
5-8	XEBSD30P06000	U	Door Frame screw	4	AA

GRILL PARTS

REF NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE
6-1	PDUC-A580WRP1	U	Exhaust duct	1	AK
6-2	LANG-A052WRP0	U	Exhaust duct angle	1	AD
6-3	PREFHA054WRP1	U	Grill reflector	1	AQ
6-4	LANG-A053WRP0	U	Grill heater angle	1	AG
6-5	RHET-A159WRE0	U	Grill heater (120V)	1	BB
6-6	QTANNA006WRE0	U	Earth plate	1	AB
6-7	XBPWW30P05K00	U	M/C screw	2	AA
6-8	PCUSUA430WRP0	U	Exhaust duct cushion	1	AA
6-9	PCUSUA419WRP0	U	Cushion	1	AA
6-10	PDUC-A579WRP3	U	Air duct	1	AL
6-11	LANG-A051WRP0	U	Air duct angle	1	AG

FASTENERS

REF NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE
7-1	XOTSD40P12RV0	J	Screw 4mm x 12mm	12	AA
7-2	XHTSD40P08RV0	J	Screw 4mm x 8mm	8	AA
7-3	XHPSD40P08K00	J	Noise unit screw	1	AA
7-4	LX-LZA011WRE0	U	Thermo cut out rivet	2	AB
7-5	LX-CZA063WRE0	J	HVT screw	4	AA
7-6	XCPSD30P06000	J	Thermo cut out screw	1	AA
7-7	XFPSD40P06000	J	TTM screw	1	AA
7-8	XOTSD40P10000	J	Air duct screw	4	AA
7-10	XOTSE40P12000	J	O/Wrap screw (W)	2	AA
7-10	XOTSF40P12000	J	O/Wrap screw (IN)	2	AA
7-12	LX-CZA030WRE0	J	TTM cover screw (not shown in illustration)	1	AA
7-13	LX-NZA026WRE0	U	M4 Nyloc nut	1	AA

MISCELLANEOUS

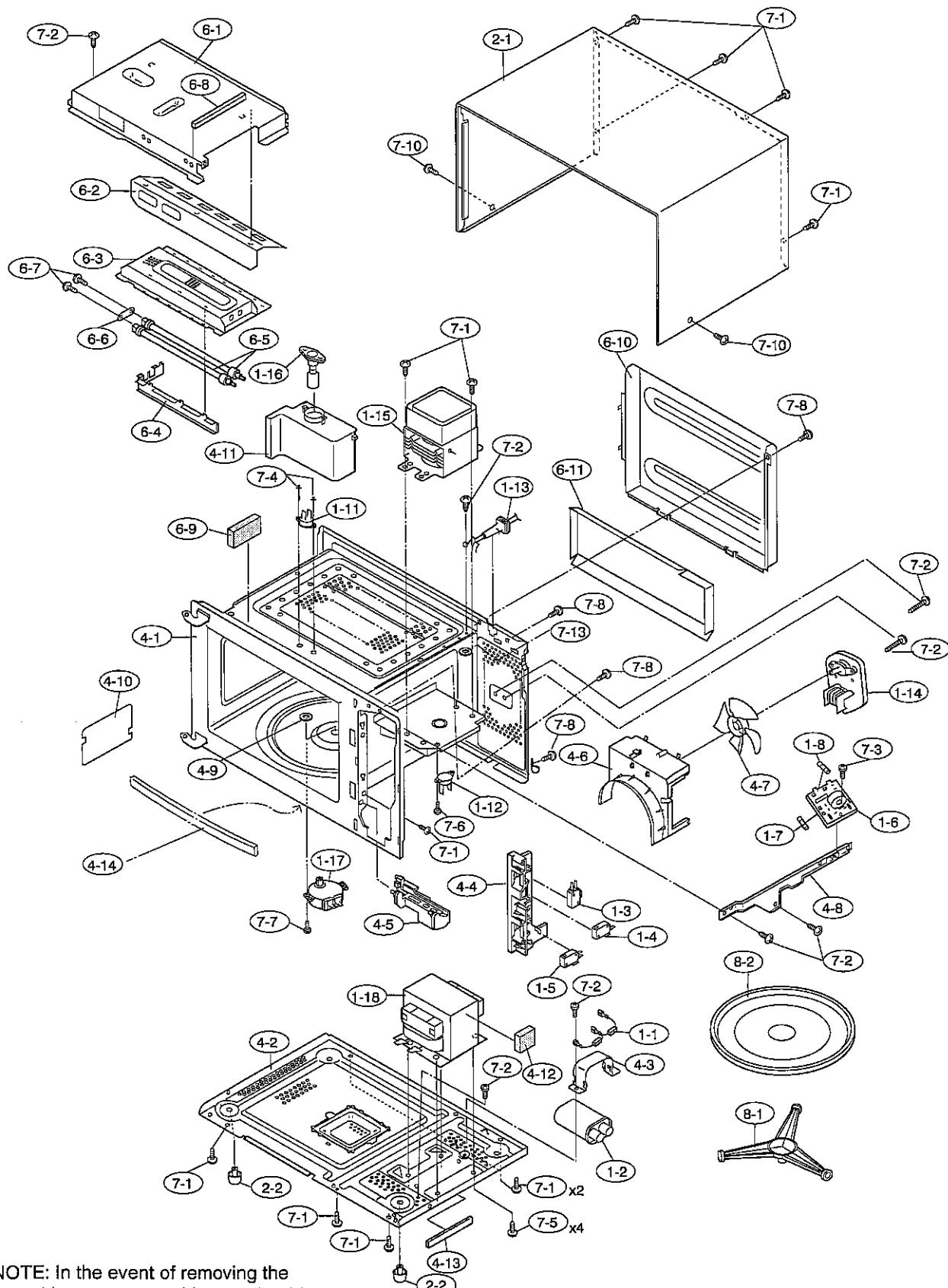
REF NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE
8-1	FROLFA070WRK2	U	Roller stay	1	AM
8-2	NTNT-A060WRE0	U	Turntable	1	AN
8-3	FAMI-A081WRM0	U	Trivet	1	AR
8-4	QW-QZA191WRE0	U	H.V. wire A	1	AF
8-5	QW-QZA001URE0	U	H.V. wire B	1	AE
8-6	FW-VZA012URE0	U	Main wire harness	1	AT
8-7	FW-VZA031URE0	U	Stop switch harness	1	AE
8-8	TINS-A041URR0	U	Instruction manual	1	AM

HOW TO ORDER REPLACEMENT PARTS

To have your order filled promptly and correctly, please furnish the following information.

1. MODEL NUMBER 2. REF. NO. 3. PART NO. 4. DESCRIPTION

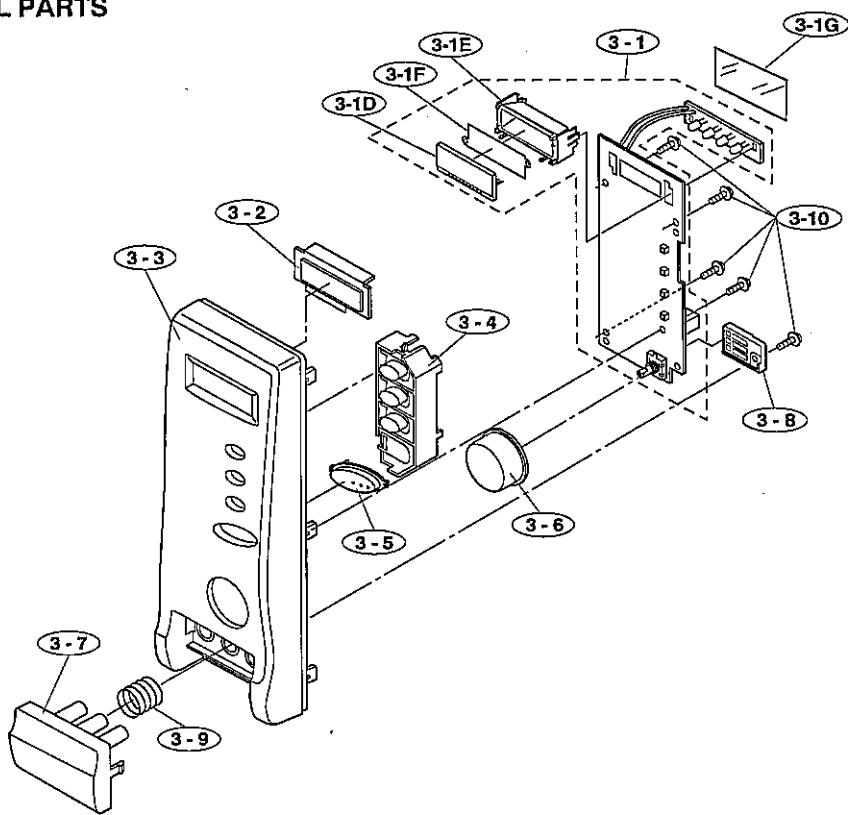
OVEN PARTS



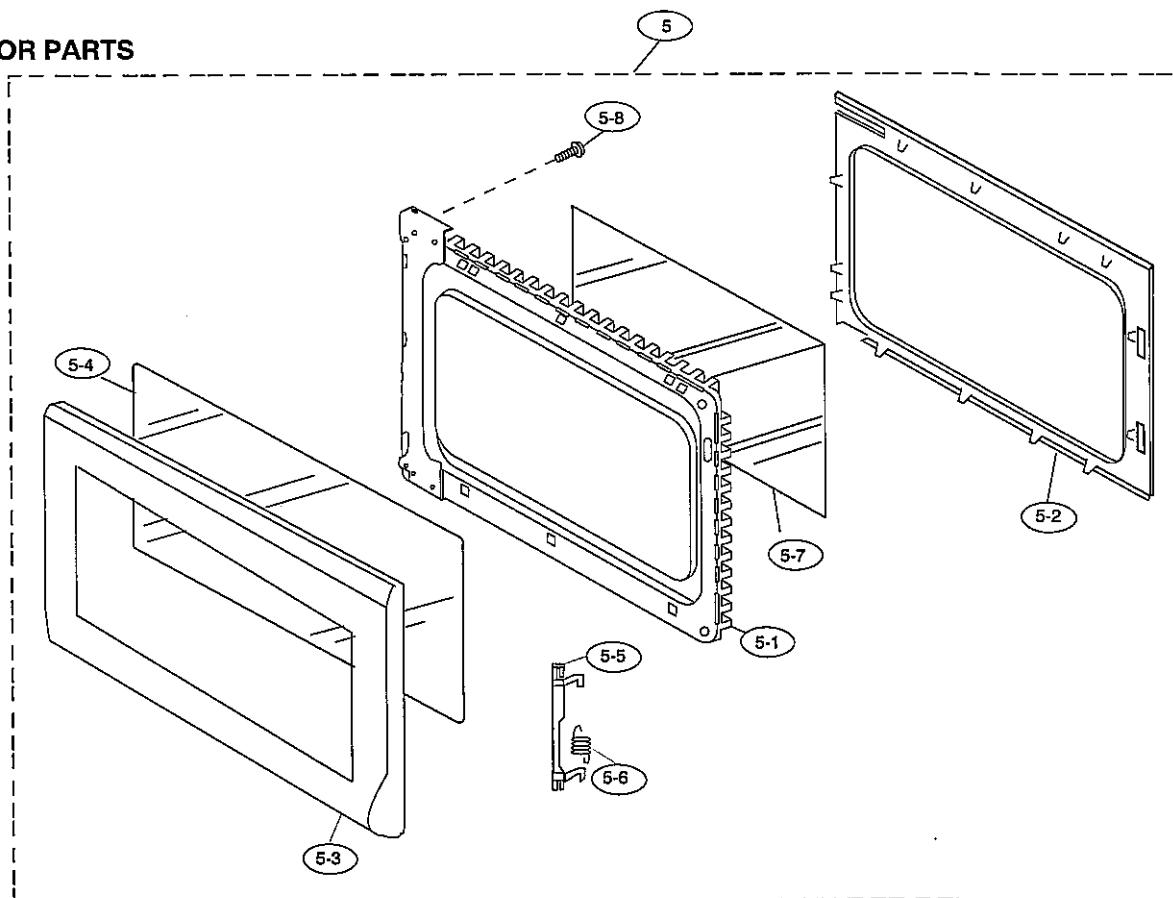
NOTE: In the event of removing the turntable motor cover this part should be refitted using screw connection:
LX-CZA030WRE0 (7-12)

CONTROL PANEL PARTS AND DOOR PARTS

CONTROL PANEL PARTS

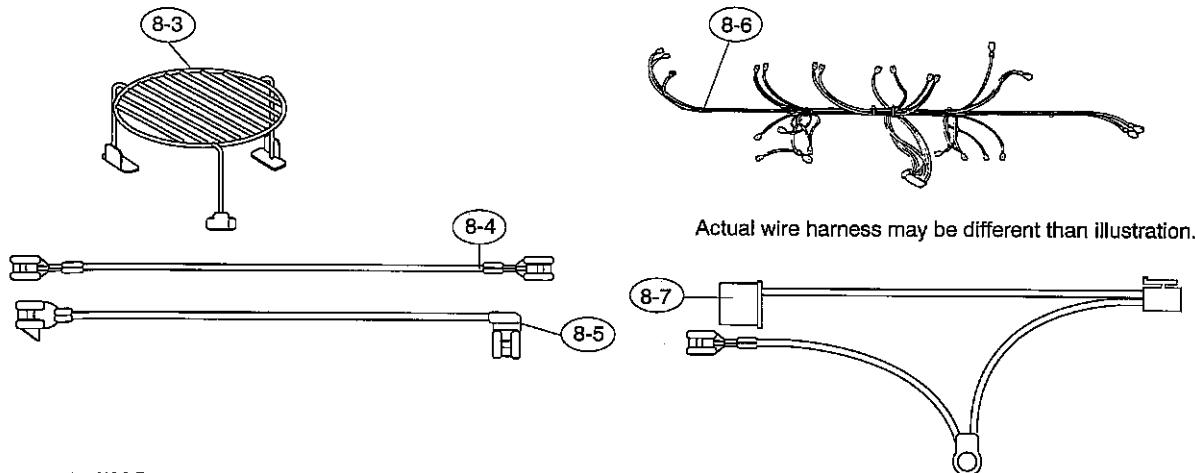


DOOR PARTS

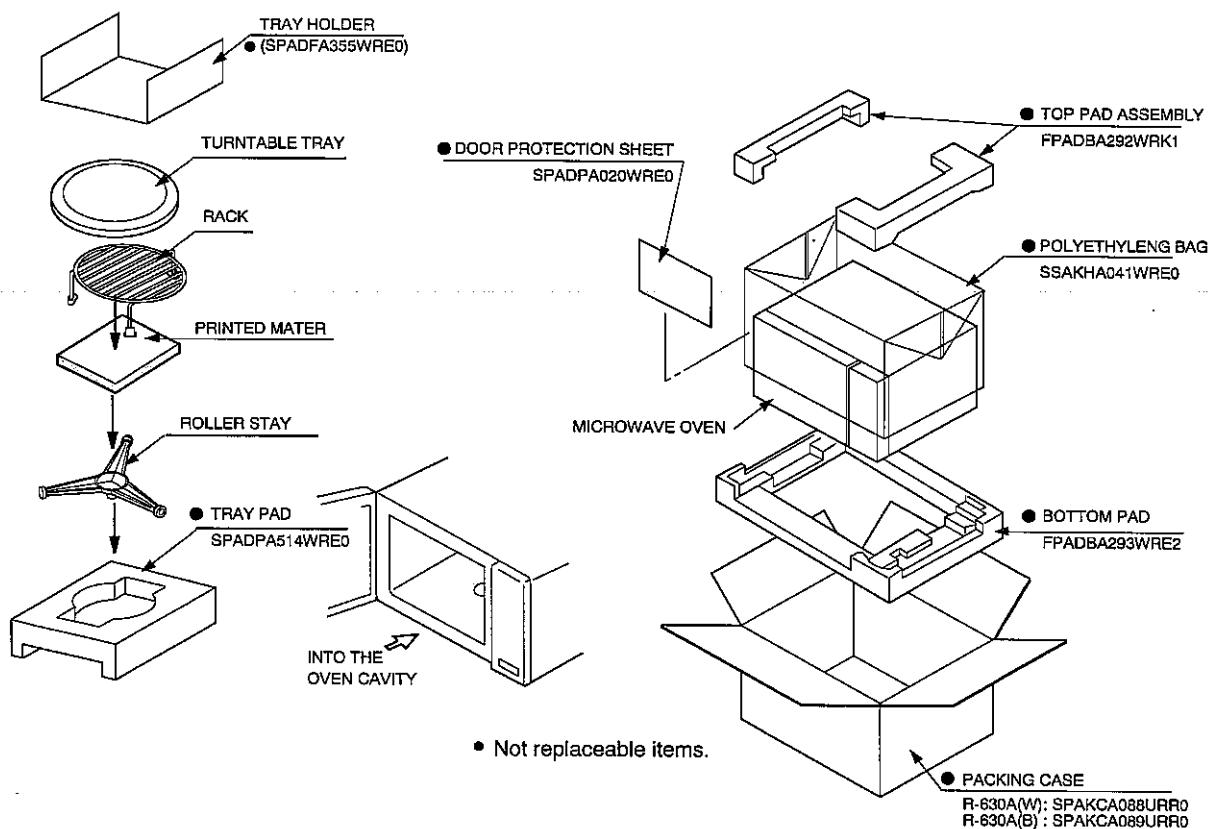


MISCELLANEOUS

MISCELLANEOUS



PACKING AND ACCESSORIES



N.B: BEFORE PACKING THE BROWN MICROWAVE OVENS A BROWN PAPER SHEET IS TO BE PLACED ON TOP OF THE OVEN

NOTES

R-630A (W)
R-630A (IN)
R-630A (B)

SHARP[®]